

UNIVERSAL
MODEL
AIRPLANE
NEWS
DECEMBER
1933.

20¢

THE ONLY MAGAZINE DEVOTED EXCLUSIVELY TO EXPERIMENTAL AVIATION"



Pick Your Christmas Airplanes

Patented April 18th, 1933
No. 1904674

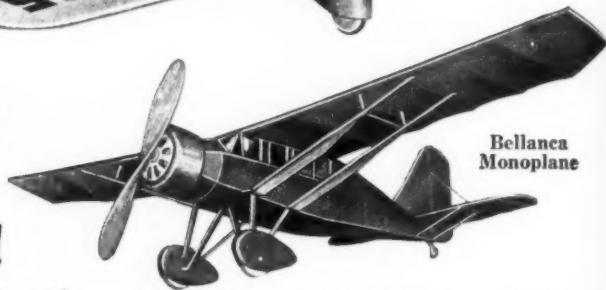


Northrop Gamma
Monoplane

**This New
Patented
Tru-Build Plan**
takes the hard work
out of Model Building!

This is a new, patented way to build-up the fuselage, wing and tail assembly construction of a Model. It is the simplest, easiest, quickest and safest method we have ever seen in all our twenty-four years experience with Models. You get a regular, full-size Plan of the Model, with all the details indicated. Also a set of Tru-build forming jigs, die-cut from cardboard. Simply thumb-tack these jigs to the Plan where they are indicated. Then place your balsa strips, bulkheads, spars, ribs and other parts into the proper slots and notches, and cement together. When dry, just lift the finished parts off the jig!!

Think of the time you can save; no more hard, tedious work trying to hold a fuselage with your fingers and cement it at the same time. No more broken parts; no more bodies out of line. This New Tru-build Idea enables you to turn out a perfect Model everytime; in double-quick time; it's the greatest advance in Model building that has been invented in a long time. And remember, only these IDEAL Tru-build Kits have this wonderful feature.



Bellanca
Monoplane

16 in. Tru-Bild Flying Models

60¢ EACH
POSTPAID
(No stamps, Please)

**Northrop Gamma
or Bellanca**

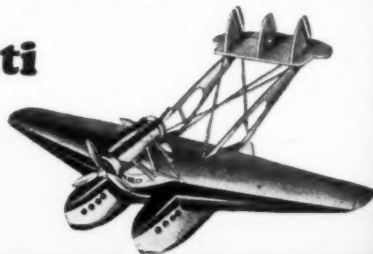
These are the slickest, smoothest Models you ever saw; every stick in perfect alignment. Kits contain all materials and parts for each Model; printed balsa sheets, balsa strips, colored Jap tissue, hardwood wheels, semi-finished balsa propeller, cement, dope, full-size Plan with Instructions and the Patented "Tru-build" forming jigs. Send right away and get one of these remarkable Kits for Christmas. See how easily and quickly you can build better Models!

12 inch Replica Model of

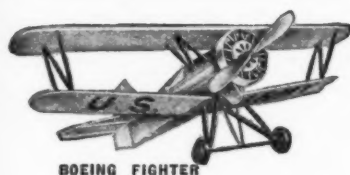
General Balbo's Savoia Marchetti
Kit

Every Model builder should have one of these remarkable Scale Replica Reproductions of the famous flagship of the Italian Armada which visited the United States last summer. This is a perfect 12-inch miniature of these beautiful ships, carved from solid balsa with every little detail faithfully copied. You'll be mighty proud of it when you get it finished and colored like the original. Kit contains everything needed to build and decorate the Model, including a full-size, three-view Plan. Get this Kit now and have a lot of fun making General Balbo's flagship.

60¢
POSTPAID
(No Stamps, Please)



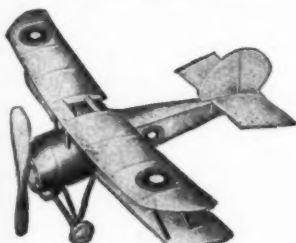
from these Popular IDEAL Models!



BOEING FIGHTER



FOKKER TRIPLANE



SOPWITH CAMEL



CURTISS SPARROW HAWK

12 and 15 in.
Wing Span

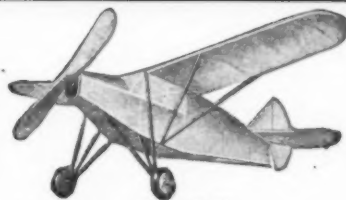
Full-Fuselage
Models



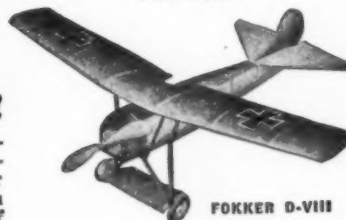
MONOCOUPÉ



HEATH PARASOL



PUSS MOTH



FOKKER D-VIII



BRITISH S. E. 5



POLISH FIGHTER

These Dandy IDEAL-O-PLANE Flying Models

will give you heaps of
Building and Flying Sport!

Every Model is full-fuselage type, with constructed body, cambered wings, shock-proof landing gear, carved balsa propeller, stamped motor plate and other features usually found only in more expensive Kits. They fly, too—and how! If you haven't built any of these Ideal-O-Plane Ships, you have a surprise coming to you! These Kits are complete in every detail. Accurately printed balsa, ready to cut, wire parts formed and ready to use, colored Jap tissue, balsa strips, bamboo cut to size, hardwood wheels, live rubber, cement, and everything needed to build the Model is included. All details are shown on the full-size Plan. These Kits have always offered superior value, and now they give you more for the money than ever. Send along your order now for two or more of these fine Models.

Your choice of any two

Kits **60¢** Postpaid

(West of Denver, Colo., send 10¢ extra for long distance postage.)
No Stamps, please; send cash or money order.

Popular
Models

Guaranteed
to Fly



SPANISH GALLEON



MAYFLOWER



FLYING CLOUD



CONSTITUTION



HALF MOON



SANTA MARIA

There's More fun Ahead Building Miniature Ship Models

Beautiful, realistic Miniature Models of Historic Ships, 6-in. size, finished in wonderful coloring and accurate details. They're fine for your room, den or workshop—make dandy Christmas presents. Making them is real fun because it's so quick and easy. Everything comes in a complete Kit ready for action. Hulls are carved from balsa blocks; masts, rigging, fittings and other details are included; even the chocks to hold them upright. Build yourself a fleet. You'll enjoy doing it and have Models everyone will admire. Make your selection from the Ships above, and get started on this new Model making idea.

Any 2 Kits
Delivered
for only

60¢
POSTPAID
(No Stamps, Please)



IDEAL AEROPLANE & SUPPLY CO., Inc.
20-24 WEST 19th STREET,
NEW YORK, N. Y.
Canadian Branch: Canadian Model Aircraft, 3007 St. Antoine St., Montreal.



Universal Model AIRPLANE News

VOL. IX

No. 5

Edited by Charles Hampson Grant

CONTENTS

DECEMBER — 1933

| | |
|--|----|
| "SKYHOOKS"—PAST AND PRESENT | |
| by Lt. H. B. Miller | 6 |
| THE HANNOVERANER FIGHTER | |
| by Willis L. Nye | 8 |
| THE WORLD'S GREATEST AIRLINER | |
| by Donald W. Douglas | 9 |
| THE WACO TAPER WING MODEL 220 | |
| by William Wylam | 10 |
| THE DEVELOPMENT OF THE FOKKER | |
| FIGHTERS—PART 5 — by Robert C. Hare | 11 |
| BUILDING THE DE HAVILLAND GIPSY MOTH | |
| by Elmer Pilzer | 13 |
| THE AERODYNAMIC DESIGN OF THE MODEL | |
| PLANE — by Charles Hampson Grant | 19 |
| AIR WAYS—HERE AND THERE | 20 |
| MODEL NEWS FROM OTHER COUNTRIES | 23 |
| BUILD A PIVOT WING PLANE | |
| by Barnett Feinberg | 27 |
| "SHOTS" FROM THE I.A.A.P.E. | 29 |
| THE NEW B/J NAVY OBSERVATION | |
| (3 VIEW) | 29 |
| THE SOPWITH TRIPLANE (3 VIEW) | |
| by Burton Kemp | 29 |
| BUILD THIS SIMPLE TAILLESS PLANE | |
| by Marshall Mulvany | 31 |
| AVIATION ADVISORY BOARD | 32 |
| THE BOOKPLATE | 34 |
| WHY I LIKE TO BUILD MODEL PLANES | |
| (CONTEST) | 34 |



In Our Next Issue

On The Frontiers Of Aviation, by Robert Morrison gives you important details and plans for planes that embody the latest developments in aviation.

Carl Goldberg gives the latest information on Indoor Model trends in *Keeping Pace With Model Science (Part 2)*. (Circumstances made it impossible to publish this article in the December issue as scheduled.

Joe Battaglia brings you a set of fine plans to build an unusual scale model, in, *The Northrop "Sky Chief" in Detail*. (Circumstances made it impossible to publish this article in the December issue, as scheduled.

The Evolution of the Airplane, by David Cooper, the first of a series of articles that shows you how the airplane grew from impractical dreams to the present highly developed machine.

You also will have excellent plans and instructions to construct a Flying Scale Model of a Boeing 247, by Wm. H. Durand.

Other regular monthly articles and Three View Drawings will keep your knowledge of model aeronautics up to date and afford you hours of pleasure.

Published Monthly by JAY PUBLISHING CORP., Myrick Bldg., Springfield, Mass.

Editorial and General Offices, 125 West 45th Street, New York City.

George C. Johnson, President.

Jay P. Cleveland, Secretary

Jay P. Cleveland, Advertising Manager, 125 West 45th Street, New York, N. Y.

Entered as second-class matter June 5, 1929, at the Post Office at Springfield, Mass., under the Act of March 3, 1879.

Copyright 1933, by JAY PUBLISHING CORP.

Price 20c a copy. Subscription price \$1.65 a year in the United States and its possessions; also Cuba, Mexico and Panama. \$2.00 in Canada. All other countries \$2.50 per year.

Contributors are especially advised to be sure to retain copies of their contributions, otherwise they are taking unnecessary risk. Every possible effort will be made in our organization to return unavailable manuscripts, photographs and drawings (if accompanied by postage), but we will not be responsible for any loss of such matter contributed.

National Model Construction Kits

The Joy of Every Model Builder



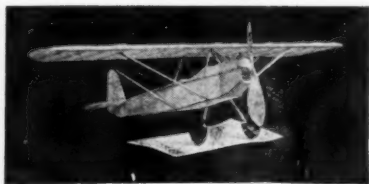
Their accurate design, complete detail, ample and excellent quality assures you of satisfactory results for your time and effort.

More than 50 models to choose from.

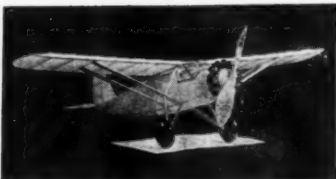
Modern and war time planes, sport and commercial.

National kits sell from 25c to \$3.00 each, plus postage. The price of each kit is governed by the size, quantity and assortment of materials required to build a perfect flying scale miniature of the plane to be modeled.

You can be sure every National kit you buy regardless of its price offers excellent value and contains many exclusive features of our own development and not to be found in other kits.



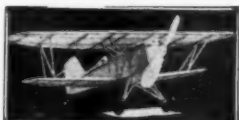
24" HEATH PARASOL
\$2.00 postage 20c



24" STINSON DETROITER
\$2.50 postage 20c



24" BOEING P-12
\$2.75 postage 20c



24" CURTISS ARMY HAWK
\$2.50 postage 20c



24" LOCKHEED SIRIUS
\$2.50 postage 20c

NATIONAL 24" FLYING SCALE MODELS

as illustrated at the left, will appeal to advanced model builders. The Blue prints are full size—three view—and detail all features. Each Kit contains all necessary material to the last gadget, and is neatly packed in a strong and durable display box. Every builder of one of these models is sure of a prize possession.

THE BRITISHER SUPER MARINE Curtiss A-8 and Boeing P-12-E offer you three most interesting flying scale models of 18" wingspan. Pictured to the right you will find each an excellent replica. They are guaranteed likewise good flyers.

THE FOUR NATIONAL 12" MIDGET wartime models—Fokker D-7 and Sopwith Camel as illustrated, also British S.Z.5 and Spad are the sweetest midget flyers you ever built. Don't miss these in building your collection of midget models.

THE NEW 12" HAWK P-6-E is the newest addition to the National Midget fleet along with the 14 other model ships as offered in the 12" midget class at 50c each.

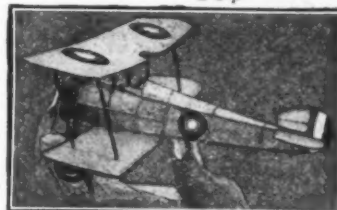
THE MONOPLANES of the midget fleet offered at the low price of 25c each, are all easy to build and corking flyers. Besides those pictured there are the Heath, Taylor Cub and Puss Moth.



18" CURTISS A-8
\$1.50 postage 15c



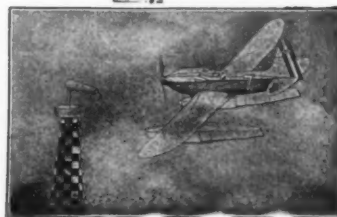
18" BOEING P-12-E
50¢ postage 10c



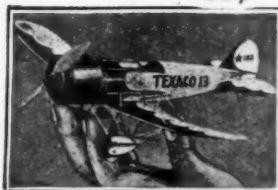
12" SOPWITH CAMEL
35¢ postage 10c



12" FOKKER D-7
35¢ postage 10c



18" BRITISH SUPER MARINE
\$1.50 postage 15c



12" TEXACO 13
50¢ postage 10c



12" HAWKER FURY
50¢ postage 10c



12" CURTISS ROBIN
25¢ postage 10c



12" BELLANCA LIBERTY
25¢ postage 10c



12" FOKKER D-8
25c postage 10c

NATIONAL BULLETIN

Write today for your free copy of the November Bulletin chock full of interest to model builders. Complete price list of supplies and many models illustrated.

AGENTS AND DEALERS WANTED

The original National Midget kits are in demand everywhere. Dealers featuring them are enjoying quick and profitable sales. Write for dealers' discount at once.

NATIONAL MODEL AIRCRAFT & SUPPLY COMPANY

BLUEBIRD BLDG., Dept. 42, NEW ROCHELLE, N. Y.
Canadian Distributor: ST. JOHN BROS. & TWOMEY
644 Portage Ave., Winnipeg, Man., Canada
Canadian prices 40% higher to cover Duty.



AIR-MINDED BOYS are becoming "MADISON MINDED" this Xmas



2-in-1 KIT

Contains the around-the-world

WINNIE MAE

(illustrated below) and the

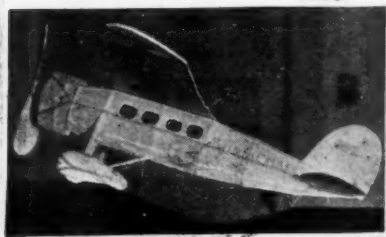
TRANSATLANTIC BELLANCA

(above)

Both 35" wing spans. Kit contains full-size plans, bulkheads, large tube of cement and a good supply of all other necessary materials needed to complete these two wonderful models. Send your order now!

75¢

Add 10¢ for Postage



ORDER NOW

For Xmas Delivery



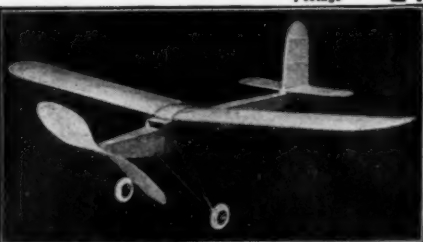
3-in-1 KIT

Plans and materials for the construction of 3 separate flying stick models. There are 3 fuselages, 3 wings and 3 propellers. The models are a HIGH-PERFORMANCE R.O.G., a SENIOR R.O.G., and a new 11 MINUTE INDOOR TRACTOR. The retail price for these 3 models is less than some companies are asking for the last plane alone. Price

Plans for 3-in-1 Kit — 10¢

75¢

Add 10¢ for Postage



Outdoor Cabin Tractor

This all-balsa model plane has a double surfaced, high lift wing, 30-inch span, all-balsa fuselage, extra strong landing gear to withstand the shocks of outdoor flying, and a large, wide-bladed propeller to keep it up for long endurance flights. Designed along accurate engineering lines. Kit contains complete plans and instructions, stamped ribs, large tube cement, 1 oz. bottle clear dope, pair celluloid wheels, and all materials needed to complete the model. Price

75¢

Add 10¢ for Postage

Madison Kits and Supplies can always be depended on for their uniform good quality, value, and service. If you are not as yet included among the thousands of satisfied Madison Patrons. Now before Christmas, would be a good time to prove what we claim for ourselves. Whether you buy for gifts or for your own use, Madison materials and prices will please you for many a Christmas to come.

NOTE

All Balsa shown here in 18" lengths can also be had in 36" lengths, if requested. Half the quantity at the same price.

Balsa Wood

This balsa is clear, straight grained stock. It is strong, light, and free from defects. If hard or soft wood is desired, specify when ordering.

18" Lengths

| | |
|-------------|------------|
| 1/16 x 1/16 | 26 for 13¢ |
| 1/16 x 1/8 | 24 for 24¢ |
| 1/16 x 1/4 | 24 for 36¢ |
| 1/8 x 1/8 | 24 for 36¢ |
| 1/8 x 3/16 | 24 for 36¢ |
| 1/8 x 1/4 | 24 for 48¢ |
| 3/16 x 1/4 | 10 for 25¢ |
| 3/16 x 1/2 | 10 for 25¢ |
| 1/4 x 1/4 | 10 for 30¢ |
| 1/4 x 3/8 | 6 for 21¢ |
| 1/4 x 1/2 | 6 for 24¢ |
| 3/8 x 1/2 | 6 for 24¢ |
| 1/2 x 1/2 | 4 for 20¢ |
| 1 x 1/2 | 2 for 20¢ |

40" Lengths

| | |
|------------|-----|
| 1/8 x 3/8 | 5¢ |
| 1/8 x 1/2 | 5¢ |
| 3/16 x 3/8 | 8¢ |
| 3/16 x 1/2 | 10¢ |

Sheet Balsa

| | |
|---------------|-----------|
| 1/32 x 2 x 18 | 2 for 7¢ |
| 1/16 x 2 x 18 | 2 for 8¢ |
| 1/8 x 2 x 18 | 2 for 10¢ |
| 3/16 x 2 x 18 | 2 for 12¢ |
| 1/4 x 2 x 18 | 2 for 15¢ |
| 1/2 x 2 x 18 | 2 for 22¢ |

Plank Balsa

| | |
|------------|--------|
| 2 x 6 x 36 | \$1.40 |
| 2 x 3 x 36 | .75 |
| 1 x 6 x 36 | .75 |
| 1 x 3 x 36 | .50 |
| 2 x 5 x 40 | 1.40 |

Prop Blocks

| | |
|----------------|-----------|
| 3/4 x 1/4 x 5 | 1 for 2¢ |
| 1/2 x 1/4 x 5 | 1 for 3¢ |
| 3/8 x 1/4 x 5 | 1 for 3¢ |
| 1/4 x 1/4 x 5 | 1 for 4¢ |
| 3/8 x 1/4 x 11 | 1 for 7¢ |
| 1/2 x 1/4 x 11 | 1 for 7¢ |
| 3/8 x 1/4 x 11 | 1 for 8¢ |
| 1/4 x 1/4 x 12 | 1 for 8¢ |
| 3/8 x 1/4 x 12 | 1 for 10¢ |
| 1/2 x 1/4 x 14 | 1 for 14¢ |

Dowels

| | |
|-----------|--------------|
| 1/8 x 30 | 1 for 3¢ |
| 3/16 x 36 | 1 for 3 1/2¢ |
| 1/4 x 36 | 1 for 4 1/2¢ |
| 1/8 x 12 | 1 for 1¢ |

Bamboo

Genuine, straight grained, no-knot TONKIN Bamboo. Strong and light. Splits easily. Dos.

| | |
|------------------|-----|
| 1/16 x 1/4 x 15" | 10¢ |
| 1/32 x 1/4 x 8" | 8¢ |
| 1/16 x 1/16 x 9" | 5¢ |

Japanese Tissue

A fine tissue for covering flying scale models. Strong, light, and takes dope well.

20 x 24 — 1 for 3¢

Veri-Fine Tissue

One of the lightest tissues known. Excellent for endurance models, because of its extremely light weight.

20 x 15 — 7¢

Colored Tissue

Just the thing for the new bright colored ships that are so popular nowadays. Red, Orange, Brown, Blue, Red, Orange, Brown, Blue, Green.

20 x 24 — 2 for .10

Wood Veneer Paper

Very useful in scale and flying-scale models. Strong, yet light enough to fly.

20 x 30 — 17¢

Celluloid Wheels

Experience has proven these wheels best for flying scale models. Pair

3" wheels — 10¢

1 1/2" wheels — 12¢

1 1/4" wheels — 15¢

1 1/2" wheels — 25¢

Bushings

for wheels — 4 for 5¢

Thrust Bearings

Light, strong bearings. Hole is truly centered.

Large size — ea. doz.

.035 hole — 3¢ 30¢

Small size — 3¢ 30¢

.025 hole — 3¢ 30¢

Model Making Pins

Pkg. — 5¢

Music Wire

Strong, springy wire sold in this new, convenient manner.

1 ft. lengths—straight

.014, .020, .025, .034

0 feet for 6¢

Dummy Motors

The very thing for adding that realistic touch to scale and flying scale models. Extremely light.

Nine cylinders.

1 1/2" diam. — 25¢

3" diam. — 45¢

Rubber Thread

Careful testing has proven this rubber to be the highest in energy content per unit of weight. This means more turns and less breakage.

.045 sq. — 50 ft. for 25¢

3/32 flat — 50 ft. for 50¢

1/8 flat — 50 ft. for 50¢

3/16 flat — 50 ft. for 70¢

Washers

For indoor, outdoor, and flying scale models.

Large size, 3/4 O.D.

Dozen, 3¢; Per 100, 20¢

Small size, 1/2 O.D.

Dozen, 3¢; Per 100, 20¢

Clear Cement

The fastest drying, lightest and strongest cement on the market. Try some now. You'll be amazed at its marvelous properties.

1 oz. tubes — .10

2 oz. tubes — .25

4 oz. cans — .40

Colored Dope

Highest quality pigment-doped. Do not confuse with inferior grades.

Leaves a smooth even color upon drying.

Blue, Red, Yellow, Orange, Silver, Black, Olive Drab.

2 oz. cans — 20¢

4 oz. cans — 40¢

Clear Dope

Just suited for the model user's requirements.

2 oz. cans — 20¢

4 oz. cans — 40¢

Acetone

For thinning out liquids.

2 oz. cans — .10

4 oz. cans — .20

ALUMINUM ITEMS

Drag Rings

Used on the real ships for cutting down wind resistance. Makes a beautiful addition to any radial motored model.

1 1/2" diam. — .20

2 1/2" diam. — .25

3 1/2" diam. — .28

4 1/2" diam. — .30

N.A.C.A. Cowlings

No dummy motor needed when this cowling is used. Has a hole for thrust bearing in the nose.

1 1/2" diam. — .20

2" diam. — .25

2 1/2" diam. — .27

3" diam. — .35

Aluminum Tubing

.010 wall thickness ft.

1/8 O.D. — .15¢

3/16 O.D. — .18¢

1/4 O.D. — .20¢

Aluminum Leaf

Real sheet aluminum, yet almost as light as paper. Makes a beautiful covering job.

.0003 thick

8 1/2" wide — 5 ft. for .05

12" wide

Sheet Aluminum

.003, 15¢ ft.; .005, 20¢ ft.

.010, 25¢ ft.

Insigma

U.S. Army and Navy type improves the appearance of models by 100%.

Each sheet contains 4 stars in circles for the wings, red, white and blue stripes for both sides of the rudder.

1" diam. — 3¢

1 1/2" diam. — 4¢

2" diam. — 5¢

2 1/2" diam. — 6¢

Sandpaper

Large Size Sheet — 50¢

PLANS

24" Flying Model

Travel Air — 25¢

"Texaco 13" — 25¢

Bellanca Pace

Flying Scale

Model 14" — 15¢

Lockheed Vega Win-

nie Mae

Flying Scale

Model 15" — 15¢

Cabin Tractor

10¢

Twin Pusher

10¢

Puss Moth De

Haviland

Flying Scale

Model 12" — 10¢

R.O.G. 3 drawing

consisting of 1 Sr.

R.O.G. Endurance

Tractor and high

performance R.O.G.

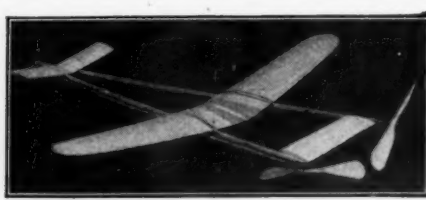
printed on one sheet.

10¢

Read Before Ordering:

On Order for Prompt Delivery Please Comply with Instructions Below. 1. Orders under 25¢ not accepted—due to our very low prices. 2. Add 15¢ for packing and postage on orders up to \$1.50; on orders for \$1.51 and over add 10% for packing and postage charges. 3. Add 10¢ extra to above charges on Balsa plank orders less than \$1.50 west of the Mississippi and Canada. 4. Postage stamps, Canadian or Foreign Coin not accepted as payment. 5. Remit by check, postal or express money order. Make payment to MADISON MODEL AIRPLANES, Inc., 134 Livingston Street, Brooklyn, N. Y. 6. Add 5¢ for insurance against breakage in transit. Canadian Charges—Add 25¢ for packing and postage on orders up to \$1.50. On orders of \$1.50 and over add 15% packing and postage. Postage stamps, Canadian or foreign coin not accepted as payment.

Dealers and Clubs Write for Special Price List



Outdoor Twin Pusher

The twin pusher that has actually flown 12 minutes on numerous occasions. It has many features not found elsewhere: 10-inch "A" frame that is a marvel for lightness and strength; 36-inch high cambered, tapered wing, and two 12-inch, high pitch props, powered by 68 feet of 1/4 flat rubber. Kit contains complete plans and instructions, stamped ribs, and all other materials needed for the construction of the model. Price

75¢

Add 10¢ for Postage



ALUMINUM N. A. C. A. COWLING

With Dummy Motor
Depth 2", Diam. 3".
Complete with instructions
for mounting.

40¢

MADISON MODEL AIRPLANES, Inc., 134 Livingston St., Brooklyn, N. Y.

Ask for Our Kits and Supplies—On Sale at Leading Department Stores Everywhere.

"FOR MODEL BUILDERS WHO WANT THE BEST"

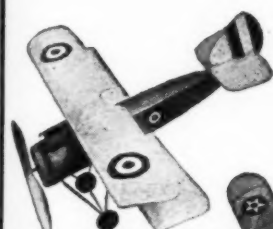
MEGOW'S MODELS

WHAT A LINE-UP!

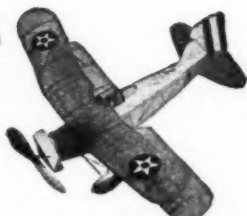


YOU CAN REALLY BUILD THESE FLYING MODELS
FROM OUR QUALITY KITS

For accuracy, completeness and all-around quality, Megow's Kits cannot be beaten. The wing ribs, fuselage formers, machine guns and other specially parts are clearly printed on balsa sheet, ready to cut and cement into place. Each kit also contains a bottle of cement, bottle of banana oil, propeller, shaft, rear hook, rubber motor and a low-pitch machine carved propeller, ready to be sanded and finished.



12" SOPWITH



13 1/2" HELL DIVER

WACO

18"

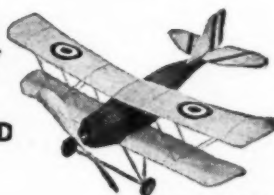


MONOCOUE
18"



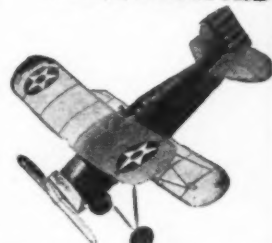
12" SPAD

12 Inch
Wingspread



12" ANSALDO

25^C
EACH POSTPAID



12" BOEING

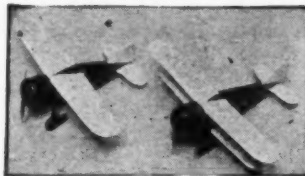
6" SCALE MODELS

Two complete models can be built from these 6 inch model kits. All wings, elevators, rudders and landing gear parts stamped on balsa. Cement, 2 colors dope, full size plans and instructions are included in this bargain.... and for gifts, we suggest that you buy a number of these kits.

Buy these
Megow Models
Now for Christmas
Gifts. You can't go
wrong.



HALL'S GEE BEE and
HAWK'S SKY CHIEF



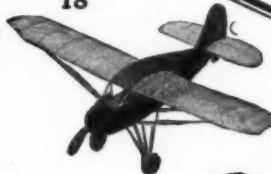
LOCKHEED MONO. and
LAIRD SUPER-SOLUTION

2 Models

25^C

EACH KIT
Postpaid

BELLANCA
18"



18" VOUGHT
CORSAIR



18" WINGSPREAD
35^C
EACH
Postpaid

Below at Right:

SOMETHING NEW:—THE GEE-BEE 24" SuperSportster Kit with all body formers,—as well as wing ribs—stamped on 3 separate balsa sheets! Now you can build this model of Capt. Roscoe Turner's record-breaking transcontinental plane accurately and easily. This is our most complete kit, containing not only all material necessary, but also a 3" celluloid motor, aluminum wheels, carved 7 inch propeller.



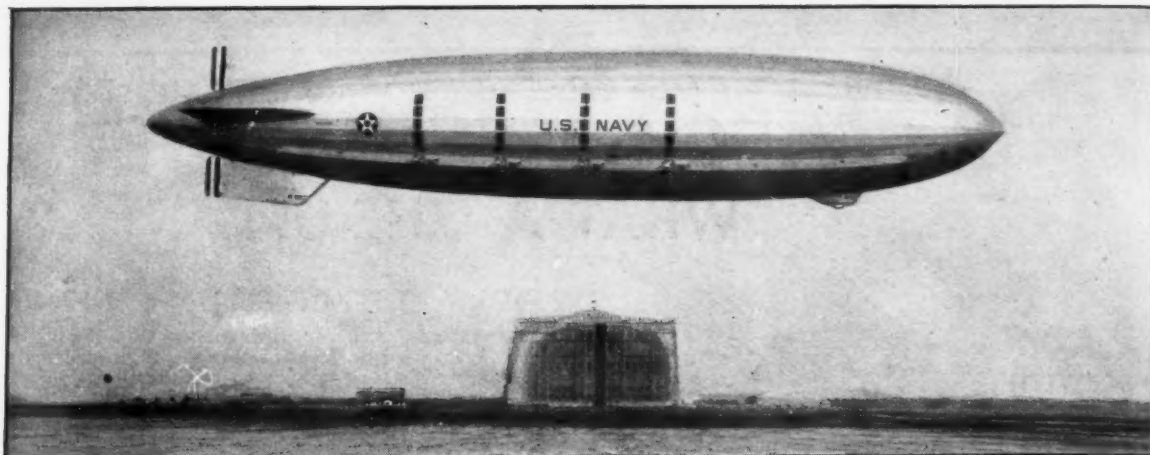
GEE BEE
\$1.50

Postpaid

MODEL • AIRPLANE • SHOP

N.E. Cor. Howard & Norris Sts., Phila.

DEALERS: Write for Details and Discounts.



The flying hangar, Macon, leaving its base at Lakehurst for scouting maneuvers.

"Skyhooks" Past and Present

The Story of "Hooking On" from the Early Experiments of Montgomery to the Modern Methods Used on the Macon

By LT. H. B. MILLER

MOVING as mysteriously as the clouds above her, a gigantic silver-hued airship comes into view. Sailing majestically along, she gives no indication of the activities which are taking place within her fabric-covered envelope. Suddenly a trap door opens in her keel and a whining, growling, fighting plane emerges. It has no more than flown clear when out tumbles another to join its fellow. Two more then drop out to show their fangs to any hostile aircraft which might see fit to attack the mother ship.

Buzzing about like angry hornets whose nest is threatened, they make certain that the danger is over. Then, forming a circle as suddenly as they have emerged, they fly up onto the trapeze bar with the grace and precision of acrobats. Immediately, one by one, they are hauled inside the tremendous hulk to rest until another emergency shall demand their attention.

So incredible does this maneuver seem, that several persons were heard to exclaim not long ago, "That is impossible!"—even while they were watching it.

It is but a matter of a few years until the hooking-on maneuver will be adopted whole-heartedly by lines of commercial airships plying regular trade routes. They will take advantage of favoring winds just as the clipper ships of old sailed miles out of their direct course in order to find winds which delivered them to their destination in a shorter length of time.

The tremendous size of the airship makes it possible to carry enough fuel to give it the long range

desired. On the other hand, this desirable feature also works to its disadvantage in that its ponderousness makes it to a certain extent, vulnerable to an attacking airplane. This has been recognized for many years and much thought has been given to using an airplane in combination with lighter-than-aircraft. In 1925 the English Navy made several successful attempts to release airplanes from airships but they did not go so far as to hook the airplane back on the mother ship.

About this time, the United States Navy undertook the solution of this problem. They first released a glider



One of the little fighters that are carried within the envelope of the Macon.

from the U. S. S. Los Angeles, the German-built airship which arrived in this country in 1924. Finally, a trapeze bar was suspended below the ship and a plane managed to engage its hook onto the bar of the trapeze. This was the beginning of many similar contacts and finally a passenger was transferred from the airship to the ground. Again, a passenger was taken from the field up to the airship. Things were progressing at a rapid rate now and landings were successfully made at night.

With the authorization of the U. S. S. Akron and the U. S. S. Macon, plans were incorporated for the construction of airplane hangars within these ships. Provisions were made for the operation of several airplanes from both of these monsters of the air and tiny fighting planes were especially designed for use aboard these craft.

No discussion of this subject would be complete unless due mention was made of the part model air-

planes had in the development of the releasing of a heavier-than-air craft from lighter-than-air craft. Recorded history has not been particularly kind to Professor John J. Montgomery, one of the most prominent builders of model aircraft, but the part he played in aviation is none the less important.

As early as 1884 this industrious man began the study of aeronautics but lack of time and money forced him to give up his work along this line. It was not until some years later when he had become a mathematics instructor at Santa Clara College, a Jesuit institution in California, that he permitted his mind to turn once more to the possibilities of human flight. The college authorities were tolerant of his aerial activities, allowing him unlimited time and the use of a workshop for his experiments.

AT FIRST he concentrated his attentions on the wing sections of his small models in his efforts to gain maximum lift. Moreover, he recognized the necessity for easy control and he devised a system of wing warping not unlike that being developed by the Wright Brothers at about the same time. For tests he would wander down to a nearby bridge which spanned a deep arroyo and there launch his model gliders to their fate.

His small craft showed considerable promise and their performance distinctly improved from time to time as he learned more about their construction and design. By adjusting his models he could make them "twist" and "somersault" in the air—maneuvers which are now known as the barrel-roll and the loop—after which they would resume normal flight and float on until they reached earth far below.

However, he wished to launch his craft from a much higher altitude. It was then that he had a brilliant idea. The little workshop became a place of activity—and mystery. Nobody knew what was going on and there was universal surprise at the college when the mathematics professor emerged from his se-

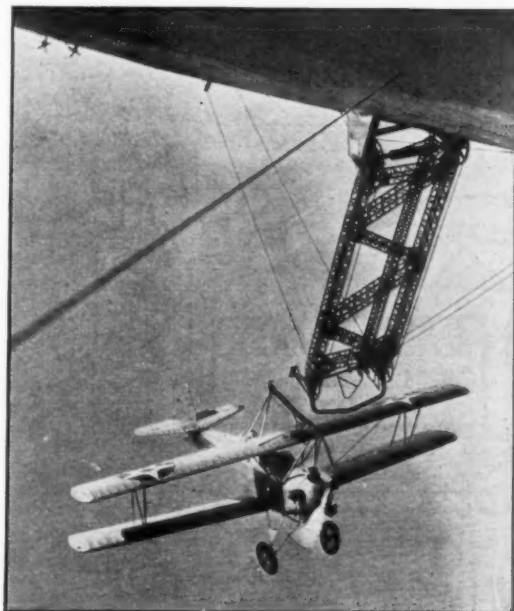


Looking down on the airship base at Lakehurst. The huge hangar is in the background.

clusion with a huge box kite! Attaching his most successful glider model to the kite he flew it to a height of four hundred feet and then released it. Obeying the setting of the controls as adjusted by Montgomery before the flight, the glider came to earth amid the happy shouts of its builder.

Satisfied with the results of his models, Montgomery began building man-carrying gliders. He slipped off to

a ranch in the Santa Cruz Mountains and, assisted by three cowboys, he began his actual gliding experiments. Day after day he worked learning the secrets of control and repairing the damages caused by his lack of flying knowledge. He had reached a high degree of proficiency when he again felt balked by lack of altitude. Shortly after, his experiments came to a close when he sprained his ankle in a gopher hole during a landing.



A Navy training plane about to hook on to the mother ship.

SOMETIME after this the Professor discussed gliding with Baldwin, a famous balloonist of the day and he inquired about the feasibility of releasing a glider from a free balloon. Baldwin felt that it could be successfully done and the services of Daniel Maloney, a parachute jumper, were acquired. Montgomery put his new flier through an extensive ground school course and taught him all he knew about the manipulation of the glider's controls. At last the first flight was set for around April of 1905.

Considerable ceremony attended the event and a large crowd had gathered by the time the hot-air balloon and the 45 pound glider, the "Santa Clara," were brought on the field in a wagon. The

work of inflating the huge bag got under way as the fire was lighted in the pit over which was suspended the envelope anchored to stakes driven into the ground. Maloney now appeared on the scene clad in gorgeous spangled tights which served further to attract a throng only too willing to be spectators to this unusual experiment. As the balloon filled and became spherical the crowd became more and more excited. At last all was ready and the glider was secured to the balloon

net by a line attached to the nose, by means of a quick detachable gooseneck. Maloney took his seat at the controls and after a last quick inspection gave the command to "let go!"

The balloon soon became a small speck floating high above, but even at this altitude it was evident that the envelope had begun to sag and lose its shape as the heated air contained within became cool and lost its lift. The glider would have to be released shortly or it would fall with the lagging balloon and doubtless would be entangled within the folds of the limp bag.

A shout from the crowd! A tiny form detached itself from the balloon and began to fall apart from it. The glider began a series of gyrations which brought forth cries of amazement from those on the ground, cries which changed to cheers as the machine at last straightened out and began a long glide to earth!

Though the shouts failed to reach Maloney's ears

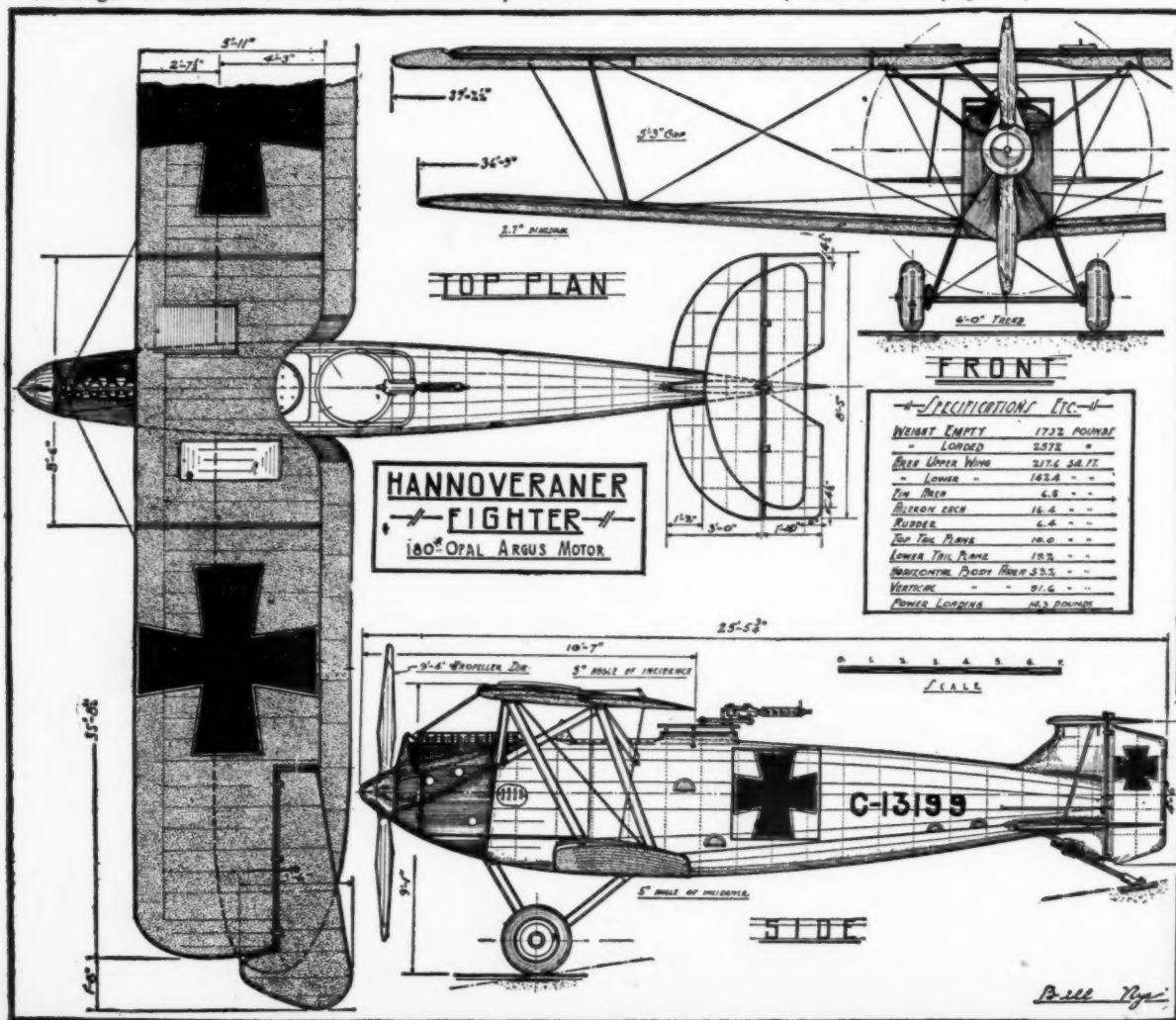


Insignia used by "hook on" squadrons.
(Published for First Time)

he had had sufficient excitement in his loneliness. He realized that the bag could carry him no higher when he reached the 4,000 foot level for it began to lose its shape and swoop about alarmingly. It was then or never. He reached for the cord which would release his craft from the envelope and, after seating himself as firmly as possible, he pulled.

SUCH a thing as a stunt maneuver was not even thought of at this stage of aviation, but as the machine was released it was standing vertically with its tail down. As the lightly-built glider began to drop at a terrific speed Maloney was performing what is now known as a "tailslide," a maneuver which is not done by all pilots even today. As the machine wobbled around dizzily, Maloney began to apply Montgomery's instructions and was more than pleased to find the glider responding nicely to the controls.

(Continued on page 40)



The World's Greatest Airliner

Unusual Features of the New DC-1 and Why It Outper- forms All Other Ships of Its Type

By DONALD W. DOUGLAS

MONTHS of engineering research and wind tunnel experiment, has culminated in the design, construction and testing of the first airplane which incorporates all of the best experience gained by Transcontinental & Western Air, Inc., the Douglas Aircraft Company and its subsidiary, the Northrop Corporation. It is the Douglas "Airliner" DC-1.

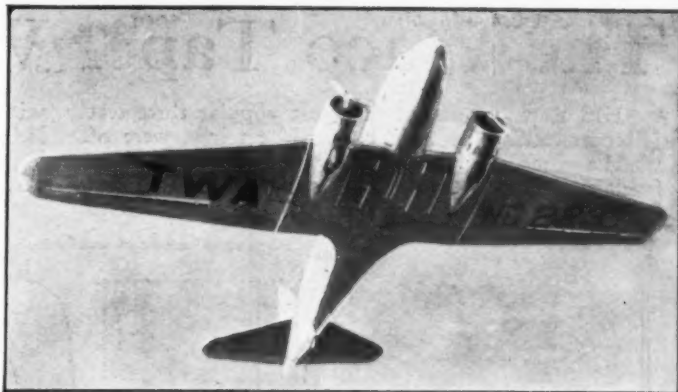
This first "Airliner" has been built at the Douglas Plant in Santa Monica, California, for Transcontinental & Western Air, Inc., under the specifications, and, following satisfactory completion of rigorous flight tests, manufacture has been commenced on the first of a fleet of twenty more.

In the development of this plane, officers of T.W.A. insisted that the primary consideration must be passenger comfort. This was attained and it has been demonstrated very definitely that it is possible to have ample space within the passenger compartment and at the same time performance which has not hitherto been associated with airplanes of this size and capacity.

The Douglas "Airliner" is a low-wing, all metal cantilever monoplane, with retractable chassis. It is a bi-motor powered with two Wright Cyclone F-3 engines, geared 11:16, each developing 710 h.p. at 8,000 ft. The high speed at rated altitude is 210 m.p.h.

The cabin is 6 ft. 3 in. high and 5 ft. 6 in. wide, and is normally fitted to accommodate twelve passengers in six rows of two each, spaced 40 in. from seat back to seat back. The width is such that a seating capacity of eighteen is possible for operations where roominess is not essential. A cargo compartment having a capacity of 1,000 lbs. is forward of the cabin and a baggage compartment with generous space for passengers' baggage is in the rear. The cockpit accommodates pilot and co-pilot, with dual controls.

The passengers' seats are of Douglas design, specially constructed and fully adjustable. They are mounted in rubber to minimize vibration and allow for individual adjustment of seat bottom and seat back.



How she looks from the ground just after a "take off".
It has a speed of 210 m.p.h.

The back is reversible, allowing passengers to face either direction.

THE floor of the cabin passes over the top of the wing rather than through it. There are, therefore, no structural obstructions in the aisle, while the six foot three inch clearance throughout the cabin insures sufficient headroom. Passengers are seated high enough about the wing to provide excellent vision from all seats. Individual reading lights, ash-trays, literature pockets, etc., have been provided for each passenger and a mesh hat-rack is installed along each side of the cabin above the windows, with a hand rail for the benefit of passengers passing up and down the aisle.

The cabin has been entirely sound-proofed under the direction of engineers of the Sperry Gyroscope Company and has a sound level at cruising speed below 70 decibels, thus comparing most favorably with Pullman car ratings. A highly satisfactory ventilating and steam heating system has been worked out in connection with the sound-proofing development. Controlled ventilation is effected by admitting air through a



At the airport ready to take on its pay load of 15 people and 1870 pounds of cargo.

vent in the nose of the fuselage and transmitting it by ducts to the cockpit, cabin and lavatory. A thermostat insures that the temperature in the cabin will be maintained at 70° F. with outside air temperature as low as 20 degrees below zero.

Entrance to the cabin is by means of a door on the left side of the fuselage. Aft of this door is located the buffet, which is complete with icebox and full facilities for serving meals aloft. There is also a completely equipped lavatory at the rear of the cabin.

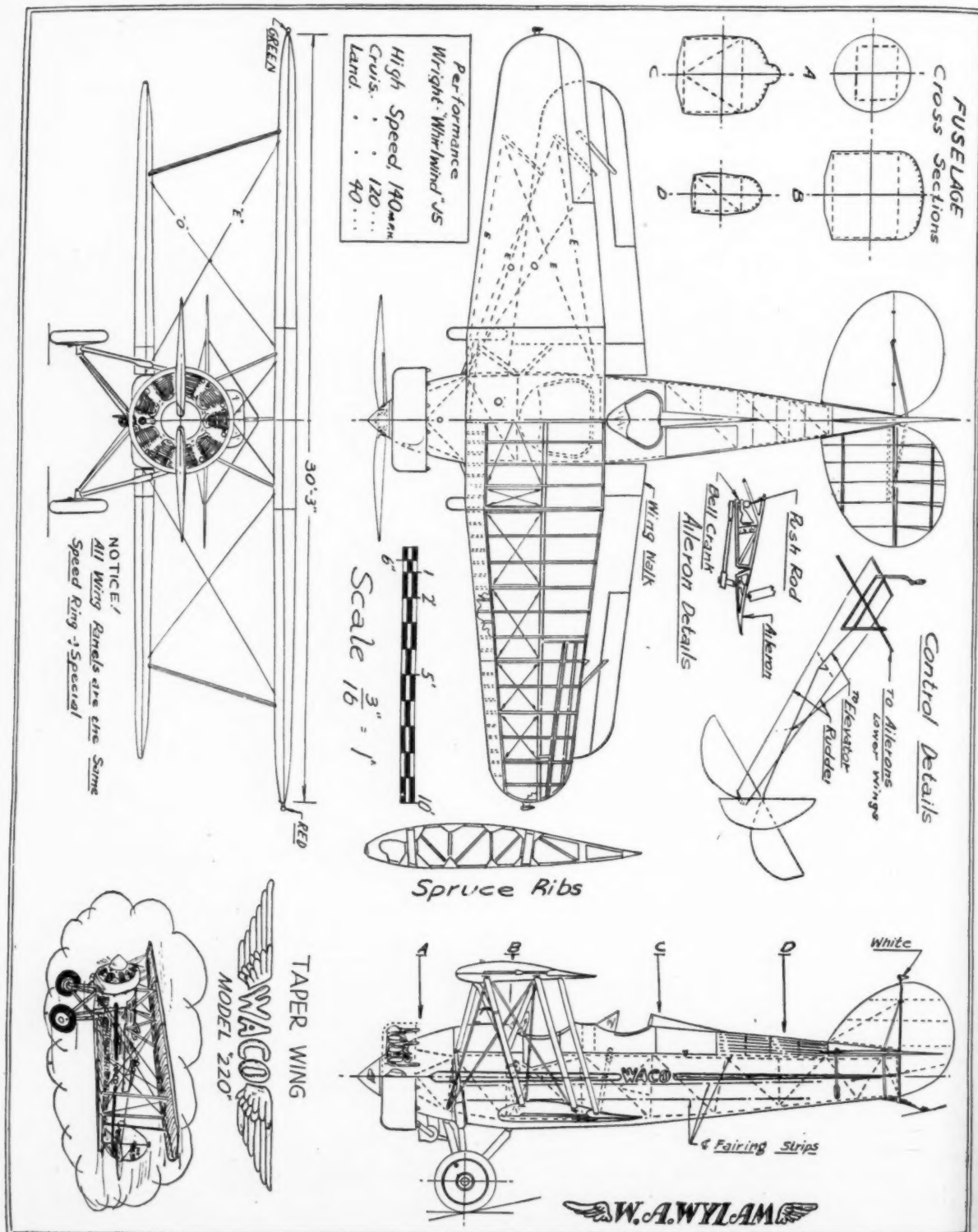
When the "Airliner" was first conceived, elaborate performance calculations were made to determine its characteristics, and from this investigation, the major dimensions were determined and a wind tunnel model constructed. This model was 7 ft. 9 in., in span, being 1/11th scale, and was tested in the 10 ft. tunnel of the Guggenheim Aeronautical Laboratory at California Institute of Technology. Three types of

(Continued on page 42)

The Waco Taper Wing Model 220

THIS ship was one of the most popular three seat commercial planes of 1930. The wings were of wood and metal construction, covered with fabric. The fuselage was of welded steel tubing. The tail unit was rigidly built of steel tubing. It was powered

with a Warner Scarab 100 H.P. or a Kinner 125 H.P. It had a high speed of 138 m.p.h. and a landing speed of 48 m.p.h. The initial rate of climb was 1500 feet per min.



The Development of the Fokker Fighters

Interesting Features of Some of the First German War Planes Produced by Fokker

By ROBERT C. HARE

PART No. 4

COMPETITION among aeroplane designers and flyers was very keen in 1914, comparable to the aeronautic condition just following Lindbergh's New York to Paris flight in the spring of 1927. Since 1911 the major countries of Europe had had regular military trials for aircraft held almost annually which increased the rivalry and advancement of aircraft. It was in these trials that Fokker got his start.

After the outbreak of war in July and August of 1914 this competitive atmosphere was more decided than ever and it was during this mad scramble for contracts and bids that Fokker produced his next craft, the M-10 Einstlg which was to enjoy a great deal of training work throughout the War.

To appreciate the significance of these planes of 1914 it is necessary for the reader to bear in mind that until this year, the first decade of powered flight had made amazingly slow progress and that aeroplanes of the Wright type were still in common use in schools. Fokker was one of those few who made his designs almost before their time. Another is Bleriot with his 1909 monoplane.

As an aeroplane, the M-10 Einstlg had an amazing career as a primary training plane in both East-



The Fokker M-10 which was used extensively on the east and west fronts as a training plane.

ern and Western theaters of War. This type almost entirely replaced the slow flying dangerous D.F.W. biplanes and monoplanes which were tricky and hard to control. In design the M-10 Einstlg was a cross between the M-7 and the M-10 Zweistlg.

Fuselage construction consisted of four longitudinal members supported by eight upright mem-

bers spaced at intervals of approximately one meter. Welding and brazing were employed as fastening means, the whole structure being further braced by heavy steel wire looped around quadrants welded to long-erons and uprights. Turnbuckles kept the wires taut. Two cockpits were let in the fuselage in tandem

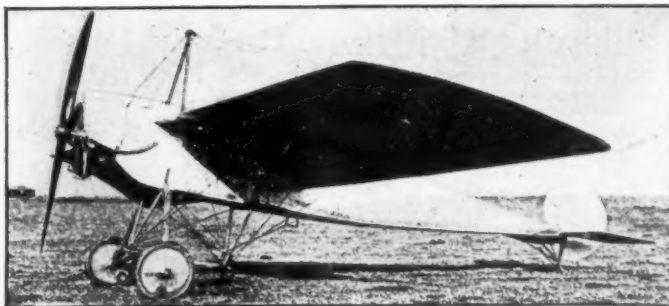
and were well padded in case of an upset.

FORWARD of the second fuselage of the upright, aluminum was used as a covering for the fuselage, while the after part was fabric covered on all sides. In Fokker machines, especially true of the fuselage, fabric was never fastened to the tube members, but was sewed to fit around the body and was laced or stitched on the underside of the fuselage.

Rudder and elevator outlines were constructed of steel tubing of small size and covered with fabric. Essentially the same outline design for these parts was used on all the early types of Fokkers as well as the M-10 Einstlg. The landing gear was a modified spring type, shock

absorbing affair carrying two wire spoke wheels.

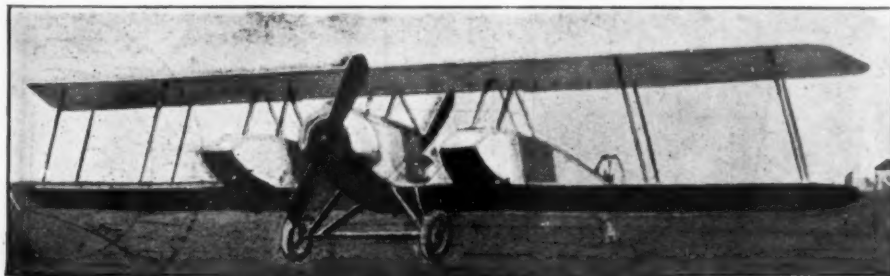
Twenty-eight ribs in the upper wing and a corresponding number for the lower plane were rigidly held together by three spars, consisting of two main spars and a heavy leading edge. Throughout the entire span of the upper plane (Continued on page 38)



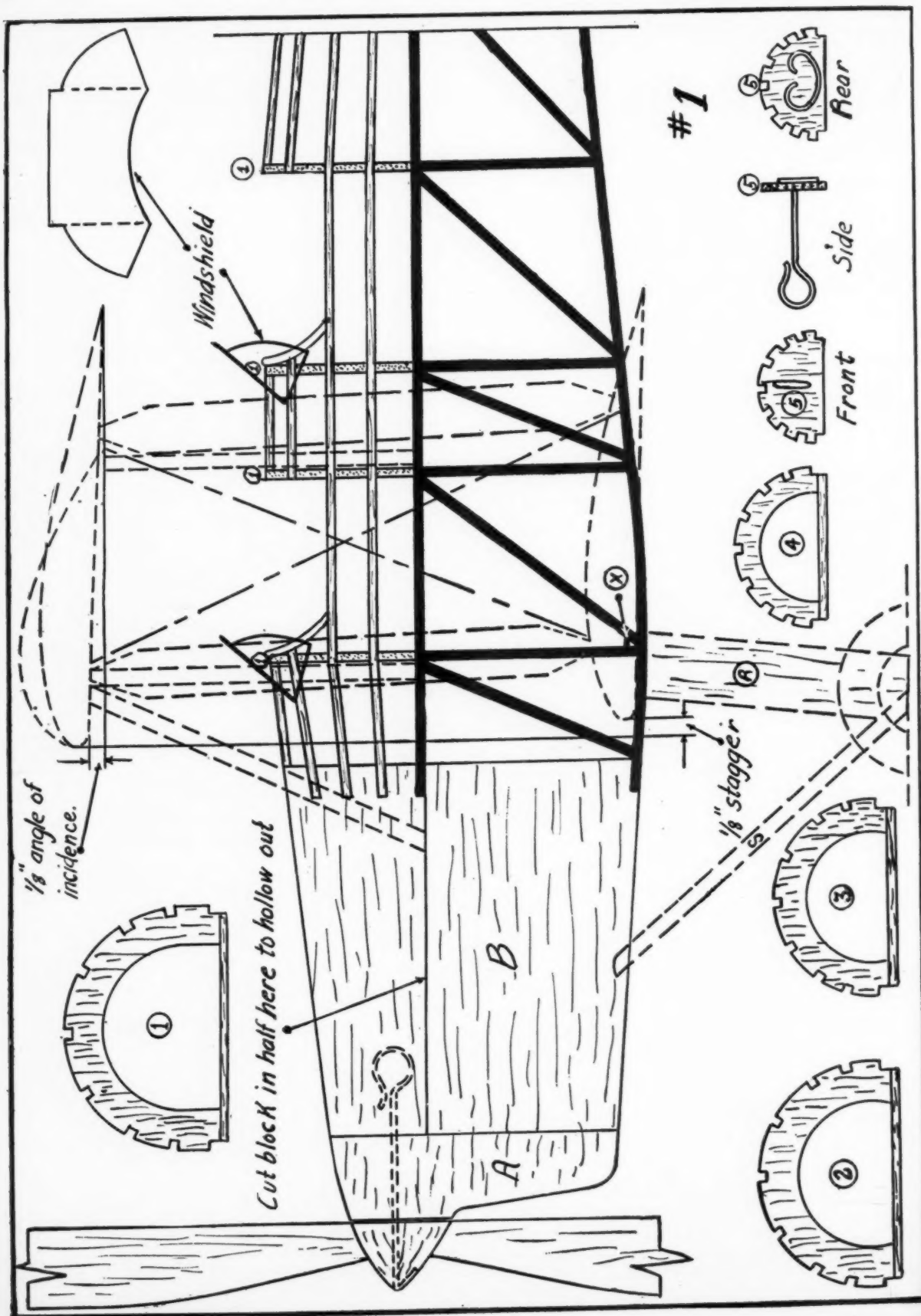
The first Fokker plane that "stunted" all over Germany, a modified M-8.



The fuselage of a Fokker biplane of the German Imperial Air Force.



Here is the Fokker Bomber K.I., the existence of which is often denied.





The neat appearance of the finished model makes the labor worth while.

The long fuselage insures unusual stability. Note the large tail surfaces.



Build a De Havilland Gipsy Moth

DURING the past six years this outstanding ship the De Havilland Gipsy Moth has had the proud title of being the lightest and safest of all trainers. The Royal Air Force uses them for general training and practice. The United States uses them mostly for sport. Its immediate response on controls, its low landing speed and marvelous stability in flight proves the reason why the Gipsy Moth is used so widely throughout the world.

It has a dependable 120 h.p. (Gipsy 3) 4 cylinder, inverted, direct drive, air-cooled engine. Its high speed is 112 m.p.h., cruising speed 91 m.p.h., and landing speed 53 m.p.h.

This model was designed from factory drawings and has nearly the same construction as the large one. Before starting to build this ship, it would be advisable to study the plans very carefully until you understand them completely.

The main feature of this model is the folding wings, which also serve as shock absorbers when the wings hit an obstacle. It may be known that the large ship also has folding wings to provide for convenient parking space.

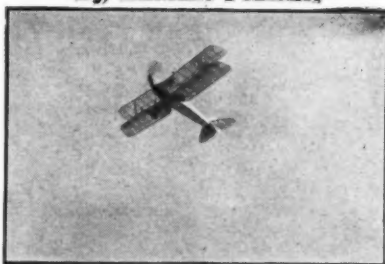
Fuselage

Before you start to build the model, I would advise you to obtain a soft flat board to work on and some transparent wax paper. The wax paper is to be put over the part you're working on, so as to keep the glue sticking to the plans.

Start by making two sides (the thick black section) alike of 1/16" sq. balsa. While these are drying, cut out the formers of 1/16" sheet balsa. This is done by tracing them on the wood with carbon paper. When these are finished and the sides are dry, glue the

Instructions and Plans to Build a Flying Scale Model of a Popular English Light Plane with Unusual Flying Qualities

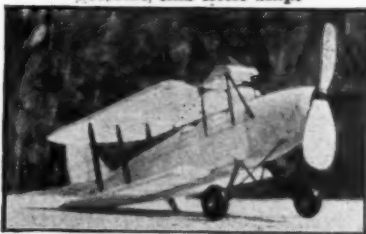
By ELMER PILZER



The model at an altitude of forty feet, flying steadily.



Quick and graceful "take offs" characterize this little ship.



Like its big brother, this model is equipped with folding wings.

MATERIALS FOR THE DE HAVILLAND GIPSY MOTH

| | |
|-----------------------------|------------------------------|
| 2 sheets of 1/16x2x36 | 2 oz. bottle of ambroid |
| 10 strips of 1/16 sq. x 36 | 1 pair of 1 1/8" diam. whls. |
| 2 strips of 1/16x1/8x36 | 5 eyelets, 4 large washers |
| 1/2 strip of 1/8x1/8x36 | 2 ft. No. 10 wire |
| 6" of 1/8 x 1/2 | 3 ft. 1/16 reed |
| 2 strips of 1/8 x 1/4 x 36 | 3 strips bamboo |
| Block A-1 1/2 x 2 1/2 x 3/4 | 5 ft. 1/8 flt. rr. |
| Block B-2 x 3 x 3 | 1 sheet sandpaper |
| Prop. block 1/2 x 1 1/4 x 7 | 2 sheets tissue |

tail ends of the sides together. Before this dries, glue in a No. 1 former, and 1/16" sq. on the bottom of the fuselage. Set this aside to dry. While you are waiting proceed by carving out the nose blocks. Block B is done by first carving out the shape, cutting it in half, hollowing out to 1/8" walls, and gluing it together again. Block "A" is shaped from front view, then side view, and then rounded off. Both blocks should be given a fine sandpapering. By this time you may proceed with the building of the fuselage by putting in the numbered formers in their respective positions. Now glue on 1/16" sq. stringers. Glue nose blocks on fuselage and put it aside.

Landing Gear

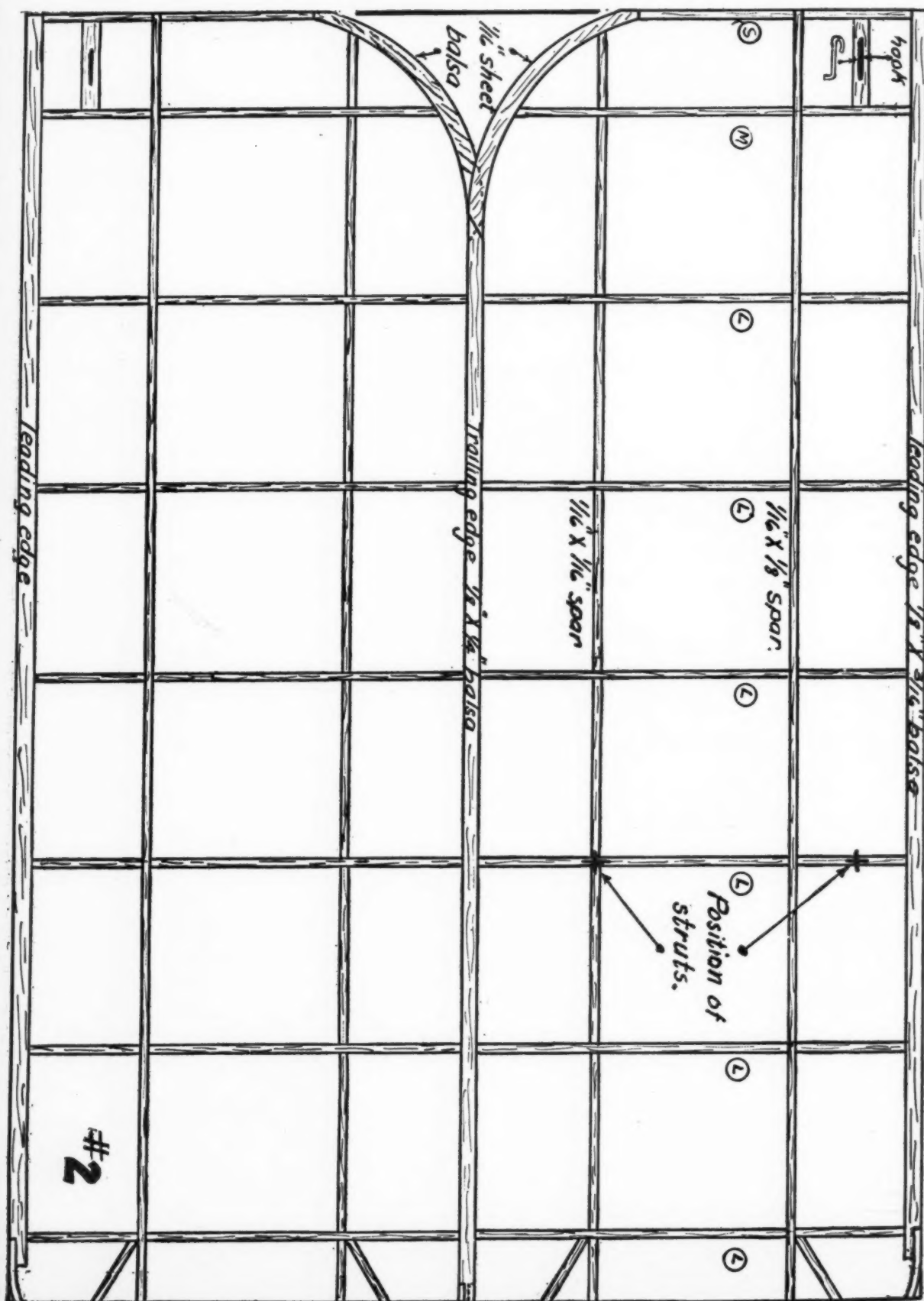
CUT and shape all the struts according to the plan. Glue struts "O" and "V" together according to the front view (No. 5), and struts "R" and "S" according to the side view (No. 1). Then glue struts "V" onto the fuselage. Now glue struts "R" and "S" also onto the fuselage ("R" connecting "O"). Glue on combination shock absorber and axle on struts "O" and wind around to strengthen axle and keep it from coming off on a hard landing. Put on celluloid wheels (1 3/8" diam.) and glue streamline on end of axle to keep the wheels from coming off. Also glue streamline at junction of "O" and "V" struts.

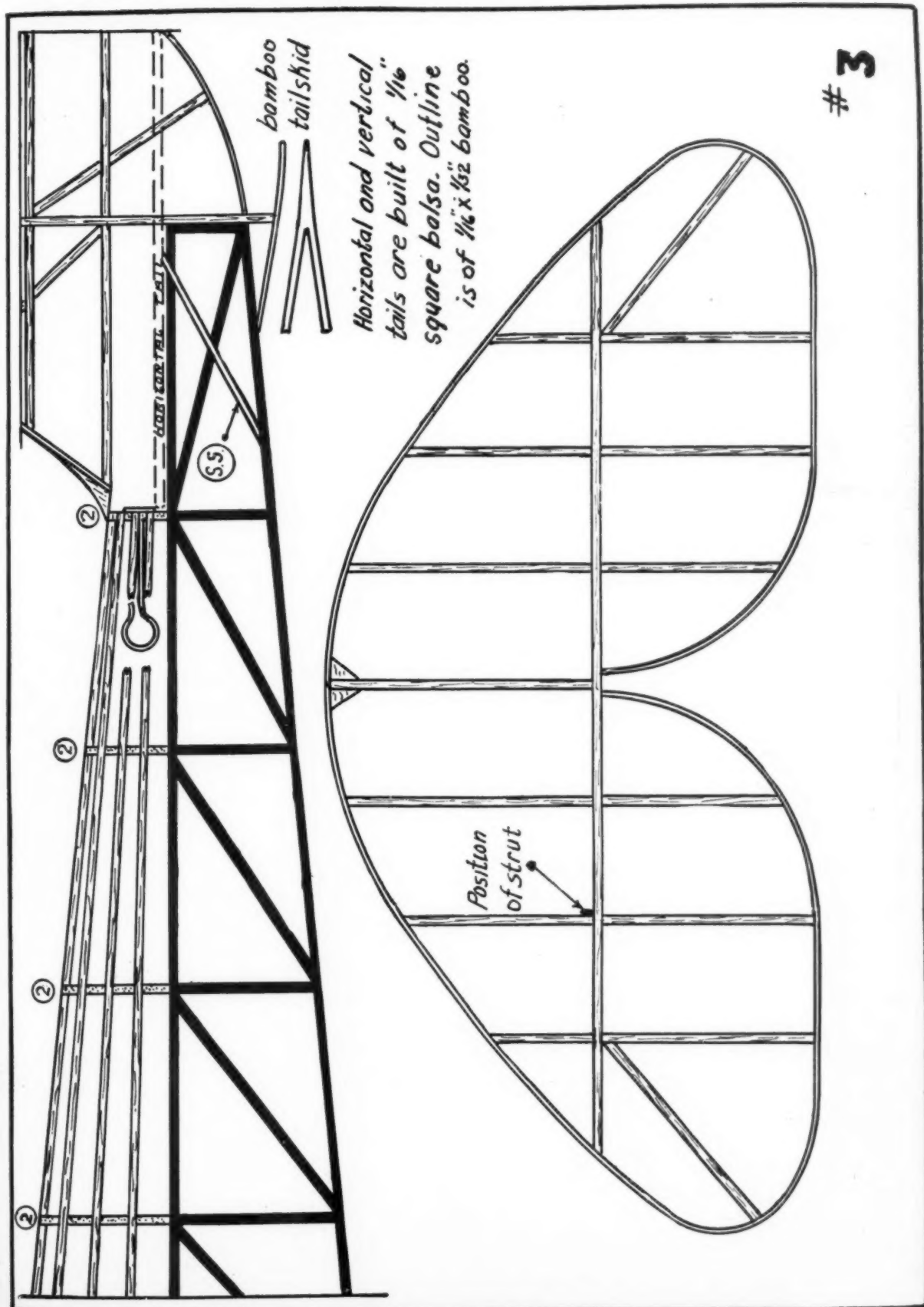
Tail Surfaces

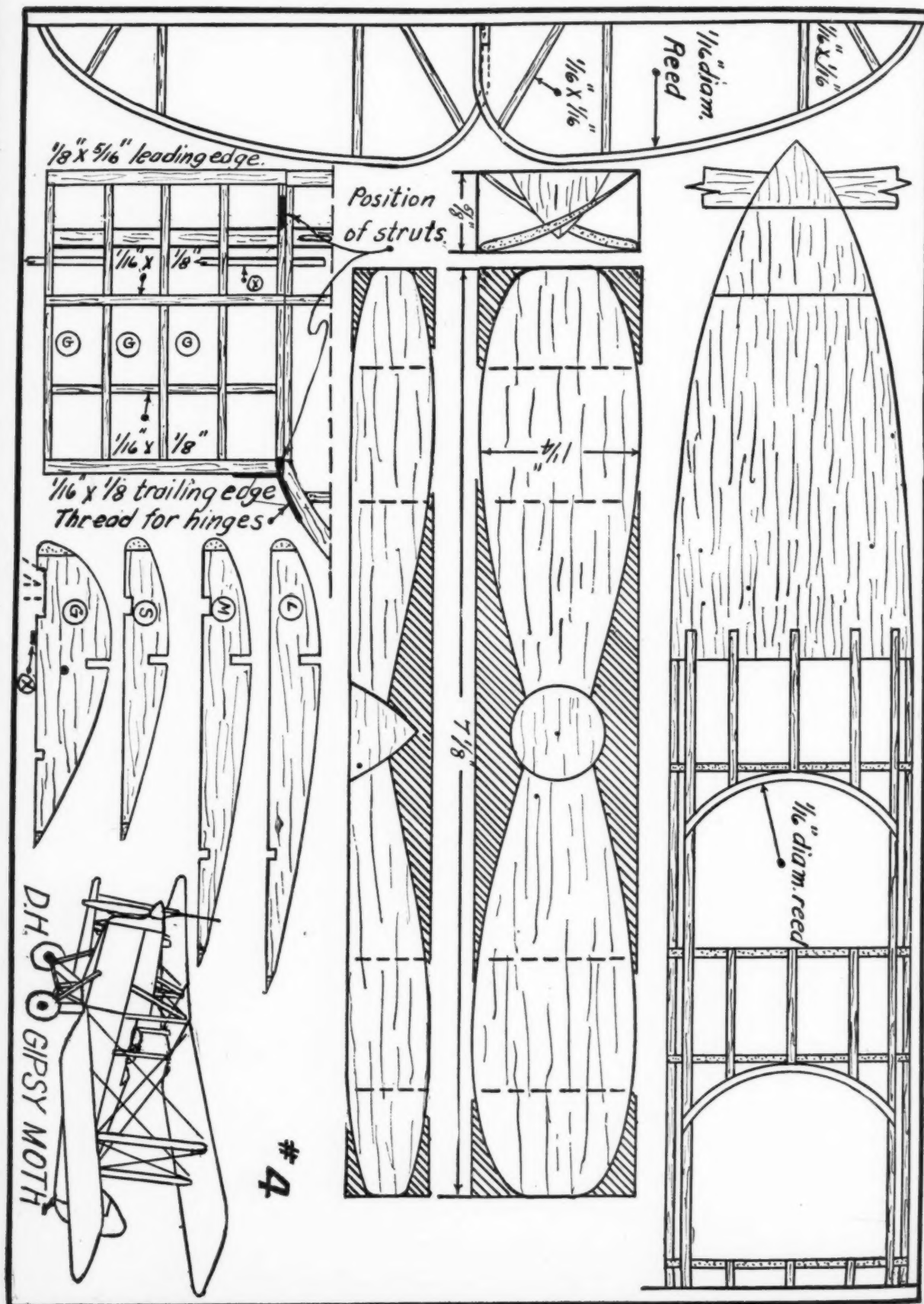
Make both tail surfaces according to plan and leave them in this jig overnight so as to prevent warping. The wing should be done likewise.

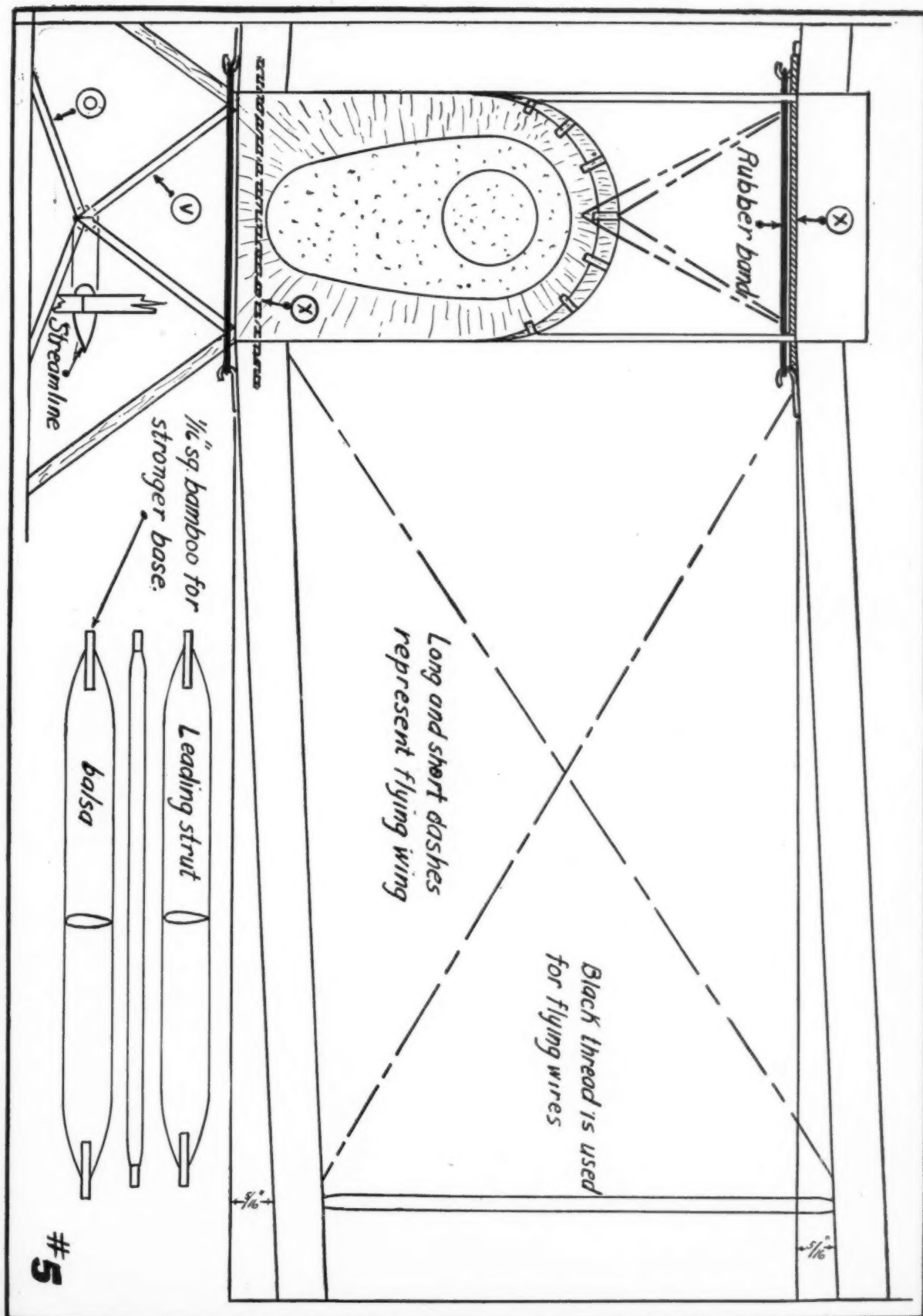
Wings

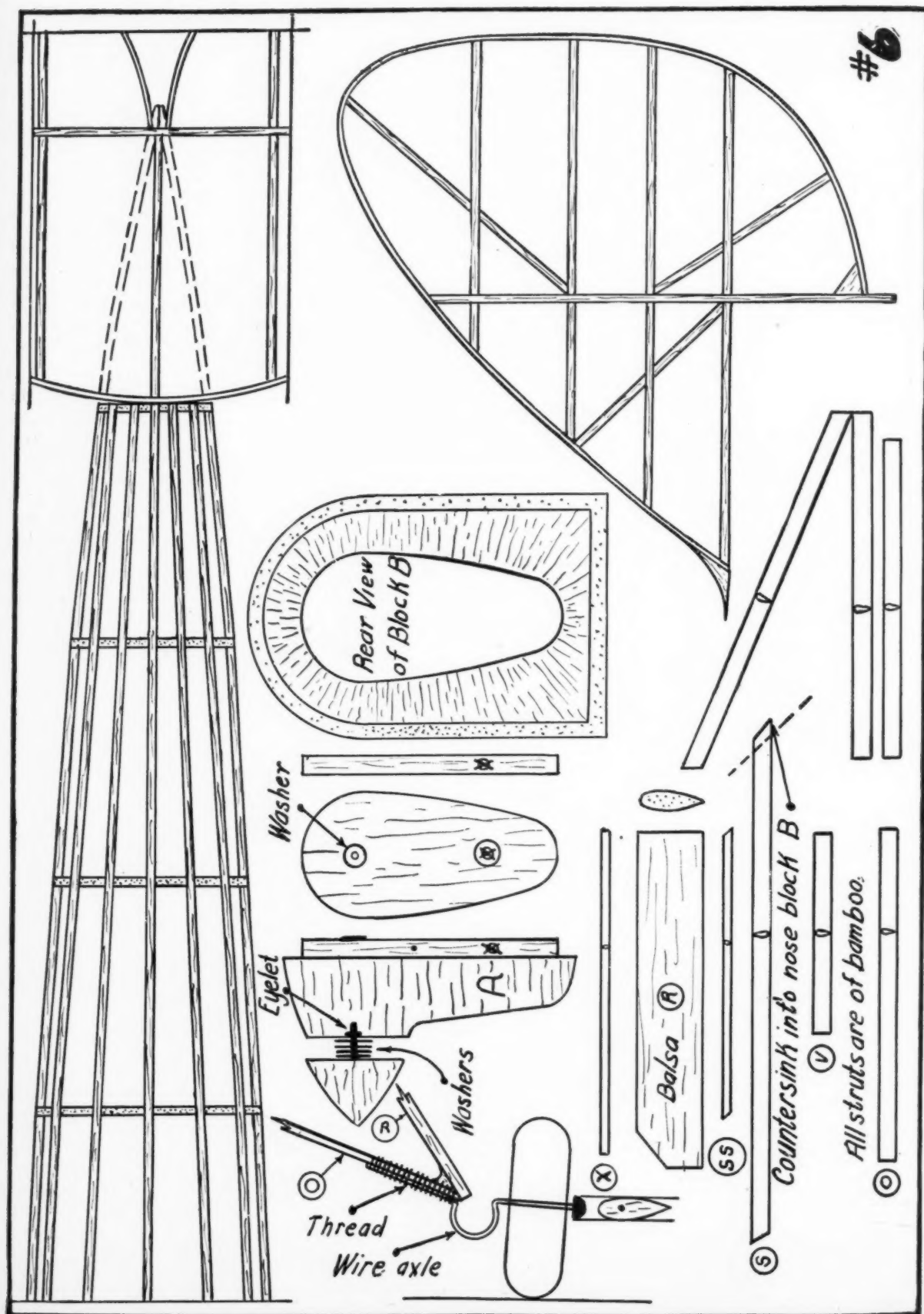
Cut out all the ribs of 1/16" sheet balsa. Put
(Continued on page 48)











The Aerodynamic Design of the Model Plane

Why Sweptback and Dihedral Wings Insure Lateral Stability and the Effect of a Low C. of G. When Used in Combination with Them.

By CHARLES HAMPSON GRANT

ARTICLE No. 22 — CHAPTER No. 3

HAVING considered some of the facts relative to determining the correct and best location of the center of gravity in our last issue, another important factor of lateral stability forces itself upon us for explanation. The action of sweptback wings has been very mysterious to some students. Let us see whether or not it is hard to understand after all.

The Action of Sweptback Wings

First let us look at fig. No. 79 which pictures a typical wing. It has been stated in previous pages that this arrangement of wing surface will "right" the plane when once it has been tilted over sideways, from its normal flight position. Let us see what the action of such an arrangement will be under these conditions.

When a plane is tilted on its side in the manner shown in fig. No. 80 it is obvious that it will slide down sideways in the direction of arrow M, pulled downhill by the force of gravity, so to speak. It is also moving forward through the air pulled by the propeller. Because of this combination of motion, the airplane actually moves in a direction indicated by arrow (M), fig. No. 79. The air is therefore moving against the wings in the direction of the arrows shown by the dotted lines. It is obvious then that the volume of air striking the low wing is proportional to the length of line (U). The air stream striking this wing has actually a width equal to (U). Now note the width of the air stream striking the high or right wing of the ship. The width of this air stream as indicated by the length of line (S) is very much less as is also its volume. Therefore, it can be readily seen that the action of the air on the low or left wing (U), will cause a much greater amount of lift on it than on the high one. Briefly, the low side of the wings meet the large volume of air squarely, thus receiving considerable lift while the smaller volume of air flows along the high wing, rather than directly across it, spilling out of the wing tip. This

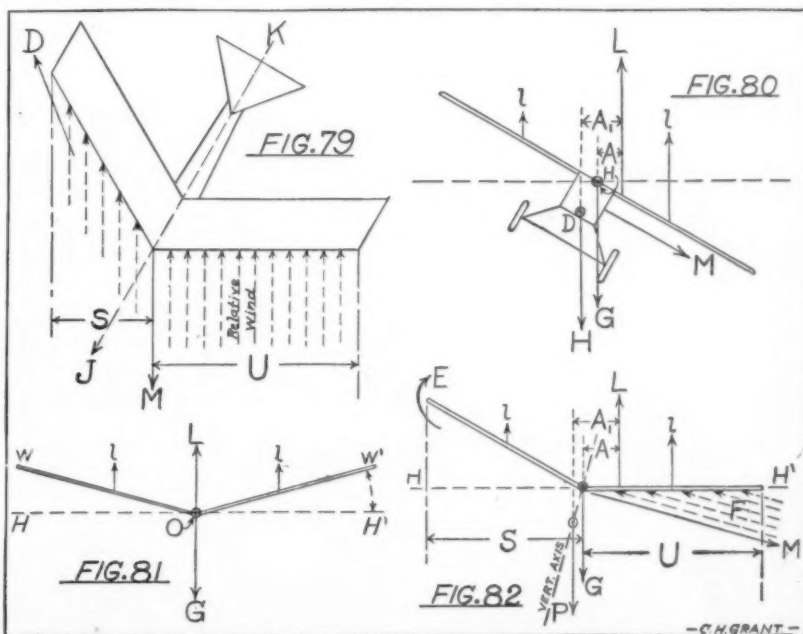
wing lifts very little due to this action.

Therefore, as the lift on the low side increases and the high side decreases, the plane is rotated about its longitudinal axis (JK), back into position. The arrow (L) fig. No. 80, is the resultant of the lift on the two wings. It acts upwards to the left of the center of the wing, for the left side lifts more as described above. (L) is to the right of the wing center in the diagram, for the plane is represented as flying toward you out of the picture. The center of gravity pulls downward, arrow (G). These two forces form a righting couple (A) which rotates the plane back to a normal flight position, as they are opposite in direction of action and do not act at the same point. The farther apart the points are, at which the two forces act, the larger and more powerful is the righting tendency.

IT IS obvious also from examination of fig. No. 79 that the longer the degree of sweepback, the wider the air stream (U) will be compared to air stream (S) and therefore, the more intense will be the righting action for any amount of disturbance.

One of the great drawbacks to sweptback wings is the spinning tendency it gives to the ship. The reason for this is quite simple. When the plane has tilted sideways and slides in the direction of arrow (M), fig. No. 79, the column of air (U) causes greater lift on the low wing as explained before. (However, the resistance on this wing increases in proportion to the lift, causing a greater drag on it. This drag acts backward at the center of the left wing (U) while the center of weight of the plane and the propeller thrust at the fuselage nose pull forward at the center of the whole span. Thus a sharp rotating couple is created, tending to spin the ship counter clockwise.

(Continued on page 36)



AIR WAYS

Here and There

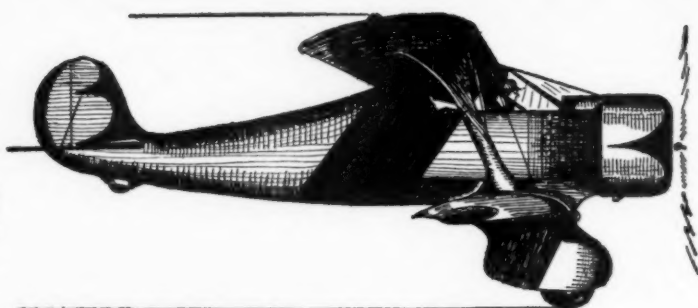
What Readers Are Doing to Increase Their Knowledge of Aviation. "Air Your Ways" Also

ACAREFUL examination of the many letters sent in to us by our Air Ways readers, brings out one very important fact. Apparently our Air Ways friends are very fine model builders but poor photographers. We can readily understand why the Eastman Film Company has been such a great success. The amount of film wasted is exceedingly impressive. Of course there are very many fine pictures which come into the office but the greater part of them are absolutely unfit for publication.

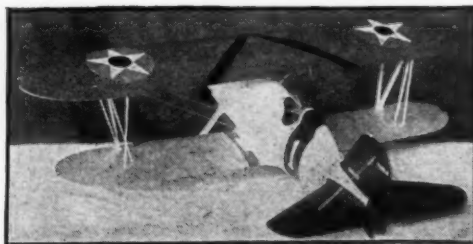
Therefore we beg that you will accept a word of advice which will save us a great deal of time and you considerable expense. The most common fault with photographs we have received is that they are out of focus. Evidently the would-be photographer uses a camera which focuses at a point far beyond that at which the model is resting. Where close ups are desired, a portrait attachment should be used.

Secondly, a suitable background should be provided, usually one that will cause the model to stand out clearly against it. For instance, look closely at picture No. 1. This is a photograph of a very cleverly built Boeing F4B-4 by W. Thurston De Groff of Westport Avenue, Norwalk, Conn. The model itself could not be criticized in any respect. However, you will notice that the upper wing is very similar in color tone to the background and does not show up well in the picture.

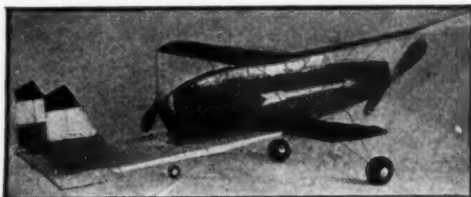
A white model may be photographed against a white background if the light strikes the model from the right direction. This model as shown in picture No. 1, if against a white background with the light so arranged that the tops of the



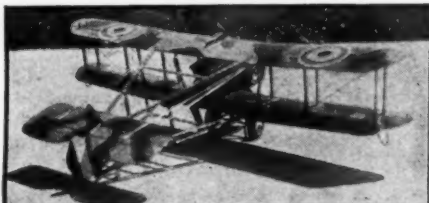
A drawing of a Beechcraft by Jim Talcott.



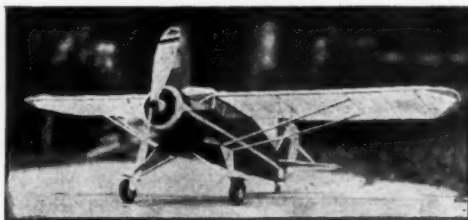
Pict. No. 1. A detail scale Boeing F4B-4, just like its big brother. By Thurston De Groff.



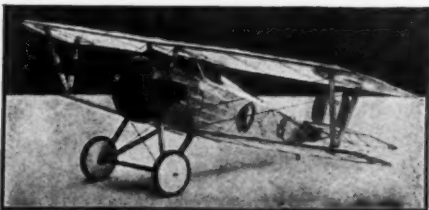
Pict. No. 2. Here is a very unique flying model with a 40 inch wing span, by an unknown builder.



Pict. No. 3. An unusual and cleverly built wartime F.E.2 B, by Harvey Schubring. The span is 22 inches.



Pict. No. 4. Gordon Cromwell has put great detail into this flying Stinson Reliant model.



Pict. No. 5. A miniature Nieuport No. 27 that flies on two 1/4 inch strands. By Joe Nieto.

wings were shaded, would show up beautifully.

If model builders are seriously interested in getting good pictures of their ships, they should buy a kodak or some camera which could be focused. Do not ever expect to get good results with a box camera. Under certain conditions fair results may be obtained but you can never be sure of this. From a photographic standpoint a box camera is an atrocity and the money spent on films wasted in this type of camera would pay for a fine and more expensive camera in a very short time.

This advice is not given in an attitude of criticism but merely as a help to those who are seriously interested in obtaining good pictures of planes.

THE drawing which graces the head of the page this month has been supplied to us by Jim Talcott of Anaheim, Calif., R.D.2, Box 83. Those of you who are artists will note that a very effective technique of cross-hatching has been used for shading. We expect to see Talcott as one of our successful artists sometime in the future.

Picture No. 2 shows a machine of original design. We regret exceedingly that we cannot give the name of this young man. We take the entire blame for this as the letter which accompanied the photograph has been misplaced. However, if the builder of this ship will get in touch with us and tell us who he is, we will be pleased to give him credit in our next issue. The design as you will note, is very unusual. It is propelled by two air screws, a two-bladed one in the front and a three-bladed pusher prop at the rear. It has a wing span of 40 inches and a length of 36 inches. It is an exceedingly fine flyer.

Picture No. 3 shows a scale



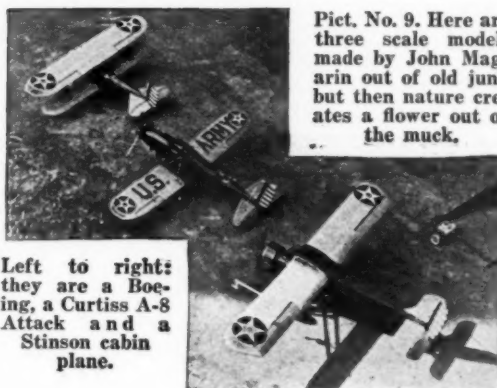
Pict. No. 8. A Clark cabin model in full flight running the gauntlet of trees. By Theodore Baxter.



Pict. No. 7. A scale P-19 autogiro carefully detailed by Wm. L. Morgan. Rotor span 27 inches.



Pict. No. 6. This Heath Baby Bullet wastes no time when in flight. It has a 67 inch span. By Lawrence Andrus.



Left to right: they are a Boeing, a Curtiss A-8 Attack and a Stinson cabin plane.

Pict. No. 9. Here are three scale models made by John Magarin out of old junk but then nature creates a flower out of the muck.

model of a wartime F.E.2 B, built by Harvey Schubring of 1779 Bayard Avenue, St. Paul, Minn. Fans of wartime planes will recognize this as one of the bombers used by the British. It has a wing span of 22 inches.

Gordon Cromwell, 508 Magnolia Avenue, Frederick, Md., honors us with a picture, No. 4, of his Stinson Reliant. It is a flying scale model of 20 inch wing span, which he tells us flies beautifully. It is a very neat looking job with careful attention paid to details.

Our old friend, Joe Nieto of 1029 Wyoming Street, San Antonio, Texas, crashes through again with a fine picture of his Nieuport 27, shown in picture No. 5. It has a wing span of 13½ inches and flies on two strands of ⅛" rubber. This little plane was built by Joe from factory plans. It is a model of the ship used by the famous war ace, Robert Soubrians.

Picture No. 6 shows a 67 inch Heath Baby Bullet in flight, which was built by Lawrence Andrus of 1005 Major Street, Salt Lake City, Utah. It is powered with 18 strands of 3/16" flat rubber. This picture which was an actual flight picture speaks for itself regarding the flight ability of the little plane.

Many of our model builders we note, have gone in for exceedingly large models. Once anyone has built and flown a large ship, we doubt if he will ever return to the practice of building smaller models. A large ship in flight provides a thrill that nothing else can give.

William L. Morgan of Monterey, Calif., P.O. Box 174, has sent us picture No. 7 of his scale model autogiro P-19. It was impossible for Morgan to get the plans of this

ship so he made up his own specifications. We would say that it is seemingly well done and very closely to scale. It is equipped with both rubber band and an electric motor, which are interchangeable. The electric motor is for display purposes and drives both the prop and the rotor. The rotor is 27 inches in diameter and wing span 17½ inches. The weight of the electric motor is 7½ ounces and with a rubber band motor, 4 ounces.

PICTURE No. 8 shows us Theodore Baxter's Clark cabin model in actual flight. This model is not strung up as it would appear from the picture. Baxter deserve credit for getting a shot like this. He lives at 414 Nat Avenue, New Bern, N. C.

Picture No. 9 shows three solid scale models built by John Magarin of 520 53rd Street, Brooklyn, N. Y. These models are remarkable because of the fact that they were built without the help of a lathe or any machinery. Every part was made from material salvaged from packing boxes, tin cans and other discarded junk. The word junk could hardly be applied to the completed models that are exceptionally well built, great care being given to details. Left to

right they are: a Boeing P-12, Curtiss A-8 and a Stinson.

We have selected two pictures sent to us by William T. Howell Jr., 1718 Parker Avenue, Detroit, Mich., because they are rather unusual. Picture No. 10 shows a Fokker Super Universal F-5 in flight after a take off from Howell's driveway. In the lower right hand corner you will note the roof of a nearby building. Howell claims that this ship flies exceedingly well with a scale prop. It is driven by three separate rubber motors of two strands each of 3/32" flat rubber, geared to the prop by a gearless transmission. The motors are 12 inches long and will take about 1200 turns, thus



Pict. No. 12. Vernier Wallingford's model Morane Saulnier in full flight.



Pict. No. 10. A model Fokker F-5 in full flight by William T. Howell. It flies with a geared scale propeller.



Pict. No. 11. It is hard to believe this is not a large J-N-4. It was also made by Wm. T. Howell



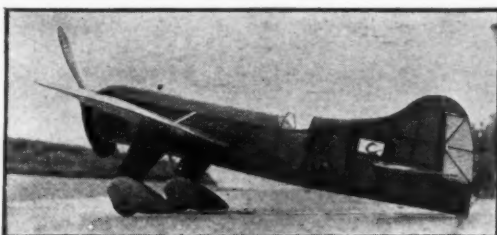
Pict. No. 13. W. O. Watkins' autogiro.

giving the endurance of a single rubber this length and still having nearly three times as much power, which is necessary to get the required r.p.m.s. to fly this ship. It makes a flight of about 150 feet and weighs about .93 ounces. The wing area is 103 square inches. It has been built carefully to scale, containing such details as radio mast and aerial, Venturi tube, step cabins, gas tanks, shock absorbers, air wheels and a nine cylinder radial motor with exhaust ring and muffler. Picture No. 11 shows Howell's wartime Trainer J-N-4. It looks very realistic indeed and might be taken for a full sized ship, especially because of the effect of the spinning prop.

Vernier R. Wallingford of Timmons, Ontario, Canada, Box 1109, has recently finished a flying scale Morane Saulnier. Picture No. 12 clearly shows what an excellent flyer this little plane is. Plans for this ship appeared in the March 1933 issue of Universal Model Airplane News. The weight of this model is exactly $2\frac{1}{2}$ ounces. It has movable rudder and elevators which allow adjustment for flight. Wallingford says that this ship has made over 130 flights to date.

W. O. Watkins of Tucson, Arizona, Box 207, lets us take a look at his recently completed autogiro in picture No. 13. Watkins says that this picture was taken during the one and only real flight of this ship. It is made nearly to scale including dummy engine, with a real shock absorbing landing gear with a half inch "take up."

ELBERT J. Weathers of 2720 Poinsettia Drive, San Diego, Calif., shows us his idea of a modern racing plane in picture No. 14. This is his original design and demonstrates remarkable flight performance as shown in picture No. 15. From the flight picture it can be readily seen that this little ship is no slouch. It has a wing spread of 2 feet and is 19 inches long. Weathers also contributes a kink which may be helpful to some model builders. Here it is: If you wish to obtain a glossy finish on your colored paper coverings, apply two coats of clear dope. More if desired. Then rub the surface quickly with an acetone-soaked piece of cotton. When it is dry, a high gloss will result.



Pict. No. 14. Elbert Weathers' idea of a model racing plane. It is of original design.



Pict. No. 15. Weathers' racer tearing off a little speed and altitude. It is really a "honey".



Pict. No. 16. Here is a Stinson Detroit gas job by William Beisheim. Wing span, 5 ft. 7 in. Trial flights take place soon.



Pict. No. 17. Young men of Hermon House Model Club going in for a little practice demonstration of their genius, at a contest in Central Park.



Pict. No. 18. This scale model of the Navy Sub. Scout by H. T. Carroll flies for 60 sec.

Picture No. 16 shows a Stinson Detroit powered with a one cylinder gasoline engine. It was built by William Beisheim of South Goodman Street, Rochester, N. Y. It has a wing spread of 5 feet, 7 inches. As yet the builder tells us that the model has not flown but has responded very well when pushed along the ground, taking off fully loaded at a good fast run and settling down to a smooth landing. The ship weighs $2\frac{1}{2}$ pounds complete. Balsa is the only wood used. The novel feature about this plan is an automatic stabilizer gravity control which works very well. As soon as the plane reaches a flying level after the take off, the elevators rise into the line of flight.

CLUB NEWS

THE Hermon House Model Airplane Club of New York City has recently tried its wings over Central Park, as shown in picture No. 17. This club gives the youngsters a break who are not well supplied with funds for intensive model building. Free classes are conducted every afternoon from 4 to 6:00 o'clock. For information, write to W. G. Meyer, 56 Second Avenue, N. Y. C.

This Club is doing an excellent work and we wish them the best of luck.

H. T. Carroll wishes to announce the birth of a new model club in the south. The club was organized June of this year, starting with three members. It has now grown to twelve members all of whom are successful model builders. The name of this club is the Nashville Model Aero Club of Nashville, Tenn. It meets once a month at the local airport and holds other meetings from time to time as dictated by the leisure of its members.

Carroll sends us picture No. 18 which shows a model of the U. S. Navy Submarine Scout, plans of which appeared in the August 1933 issue of this magazine. This little ship flies for more than 60 seconds.

Bamberger Aero Club

The Bamberger Aero Club of Newark, N. J., has been active as usual. A contest was held at the Newark Airport September 23rd, at which the

(Continued on page 44)

Model News From Other Countries



BELIEVE it or not, the first loss of life occurred in a model airplane crash in New Zealand. Mr. Ivor Freshman, general secretary of the club, recently sent us this interesting bit of news. However, he does not verify the story. He merely says that "Basil Gould sent us a report the other day that he put a white rat in a machine and sent it aloft. However, during the flight, the rat moved forward, thus changing the center of gravity and causing the machine to nose-dive. The rat was killed in the crash."

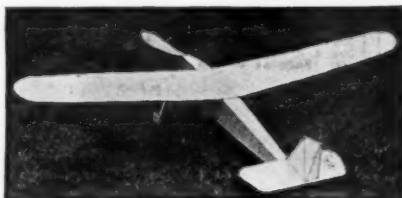
This sounds like a pretty tall story. However, nothing is new under the sun. This very same thing happened in this country except that the plane and pilot landed safely.

Sometime ago Mr. Freshman wrote us about an unusual incident in which a hawk attacked an airplane. At the time



Pict. No. 1. Planes of over five feet span launched from behind trees in the Angus and Coote contest.

Pict. No. 6. Young men of Spain study aviation under the guidance of the War Minister.



Pict. No. 4. Here is a geared motored model of 5 ft. 6 in. span, built by W. P. Fillingham of England.

Pict. No. 5. Nicholas J. Limber and a beautiful model he built recently.

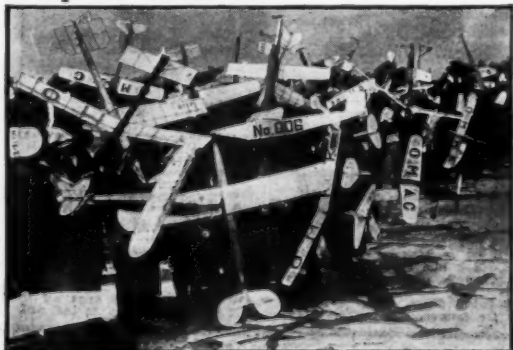


This ship proved to be such a fine weight-lifting job that it moved us to include as a pilot a small rat. He was tied in the cockpit.

The next story which is submitted by the Australians, we trust will be one that we cannot match, for the sake of sportsmanship. Nothing else.

Mr. Freshman has been kind enough to send us picture No. 1 of the Angus and Coote contests. In order to

(Continued on page 47)



Pict. No. 7. A flock of models and their Japanese builders at a recent contest near Tokyo.

Pict. No. 3. J. Lowther of Queensland won this R.O.W. contest in a gale.



Pict. No. 2. Stan Baker cleans up in a recent contest near Sydney, Australia. Competition was keen.

we wrote back and told him that the same thing had happened in this country. Now that we can match his latest story, we trust that he will not doubt the veracity of our statements here.

The machine in which the small rat was sent up in this country, was a twin-motored monoplane tractor with a small nacelle fastened to the center of the wing, midway between the two motor sticks which extended rearward, parallel to one another.

CHRISTMAS is the Time to Get These CLEVELAND



Christmas is one time when you can treat yourself to the designs of authentic $\frac{1}{4}$ " scale flying Cee-Dee models for exhibition. Show this page to those who're wondering and tell them to order early. Be good to yourself—get C-D Kits for Christmas, too.

SPECIAL FEATURES: Kits SF-17B, 18B, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Called America's Most Popular Cabin Biplane **WACO C**

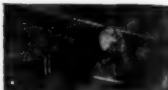
After numerous requests for this beautiful airplane during the past few months, we have undertaken to design a model of this fine commercial cabin job. It may well be called America's most popular cabin biplane. The prototype of this ship is even being sent overseas for its performance it rates well compared to jobs far more powerful. The model is beautifully colored silver wings and tail surfaces, red fuselage and landing gear, deftly trimmed in black. Span 24", length 19", weight 3.7 oz. Flights very unusual for this type of model, distance of a few hundred feet quite easily made and much more possible as experience is gained. Kit comes complete with all parts necessary including completely printed out wood sheets all material necessary making the motor and cow (which may be removed), scale and flying propellers, five bottles of cement and dope, Japanese tissue, rubber, and completely detailed full size authentic C-D drawings. Complete Kit SF-37 at dealers, or postfree, only **\$3.00**

Nine Famous "World War"



1918 DE HAVILLAND-4 BATTLEPLANE

It was produced for the United States in great numbers during the World War but unfortunately not many of them got to the front, because the Armistice was signed as they were beginning to arrive in France in 1918. Known to be one of the best designs of the time, often being used as a bomber. This authentic model makes flights as beautiful as it looks and is as completely detailed as practical. Span 31 1/2", length 22 1/2", weight 3.9 ozs. Colored olive drab, equipment and trimmings black. Its prototype, now on display in the Smithsonian Institute in Washington, D. C., was the first American DH-4. Complete Kit SF-3, only \$3.00.



Fokker D-8. Span 20 1/2", length 14 1/2", weight 2.9 oz. Colored blue and cream, black details. Complete Kit SF-34, only \$2.00.



1917 SE-5. Span 29", length 15 1/2", weight 1.9 oz. Colored natural or ivory. Kit SF-9, \$2.00.



1917 Richthofen's Triplane. Span 17", length 13 1/2", weight 1.8 oz. Colored all red. Kit SF-14B, \$2.25.



1918 Fokker D-7. Span 21 1/2", length 17", weight 1.8 oz. Colored green and orange. Kit SF-15 (while they last) \$1.50.



1917 Sopwith Camel. Span 26 1/2", length 14 1/2", weight 1.8 oz. Colored orange and green. Kit SF-10, \$2.25.



1918 Col. Bishop's Scout. Span 19", length 14", weight 1.8 oz. Colored silver and blue. Kit SF-12B, \$2.25.



1917 Albatross D-3. Span 22", length 17 1/2", weight 1.9 oz. Colored orange and blue. Kit SF-16, \$2.25.



1918 Curtiss JN-4D. The wartime trainer. Span 32 1/2", length 20 1/2", weight 2.7 oz. Colored yellow, details black. Kit SF-4, \$3.00.

Four Modern "Commercial"



1933 BOEING 247

Hailed as a masterpiece everywhere. Span 35 1/2", length 28 1/2", weight 18 oz. Colored all silver. The Kit comes complete for a flying or exhibition model with all material necessary, including partly finished nose block, ready furnished cowls, completed "bushes" wheels, stout axle material to withstand the severe shocks (the model weighs approximately 16 oz. ready for flying, you know), all the dope necessary and extra heavy covering paper. Complete Kit SF-35, including the full size, completely detailed drawings (4 panels 17" x 44"), containing every bit of information necessary for building the model, shipped anywhere in the U. S. by express in a strong box 4 x 7 1/2 x 48". Contains a large quantity of liquids, dope, cement, etc. Shipping charges collect. (Weight 10 lbs.) Only \$6.50.



1932 Buhl Bull-Pup. Span 22 1/2", length 15", weight 1.9 oz. Colored yellow and blue, black details. Kit SF-38, only \$1.75.



1932 LOCKHEED VEGA

First time this authentic Cleveland-Designed model was put on display, our engineers were told it was one of the most beautiful scale models ever designed. For flights this Cee-Dee model is a wonder. Span is 30 1/2", length 21", weight 3.7 oz. Colored brilliant red wings; tail surfaces and wheel shoes; everything else cream except black details. Kit contains new enamel dope and printed and numbered balsa. Complete Kit SF-24, \$3.25.

Your Dealer Has These, or Can Get Them

Please co-operate with us by asking your dealer for these Kits before ordering them. If he hasn't them, he'll be glad to get them or any other Cleveland-Designed model for you. But do not accept a substitute, for "the just as good" item is never just as good as the original. Ask him to do this for you and your friends who want to purchase authentic models right there in your town.

(If ordering direct, please remember Special Delivery is 15c extra per order. Also add extra for insurance, as we are not responsible for orders lost in the mail. Send no money.

CLEVELAND MODEL & SUPPLY CO., Inc.

Model Engineers
world as Master
Authentic Flying

DESIGNED Models You've Been Wishing for

—so be good to yourself. Here's a great variety of models in detail, all spectacularly real in flight and on the ground. To give you—tell them the models you prefer—yourself—want to make a big hit with your pals, give them

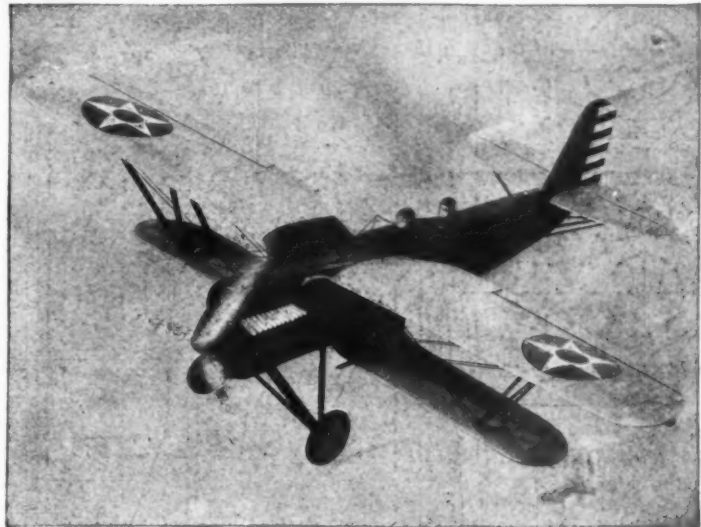
22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38 and 39 contain Balsa already printed and stamped out. ALL the irregularly shaped parts printed out. Mere—They're Great!

First Successful American 2-Seater Pursuit

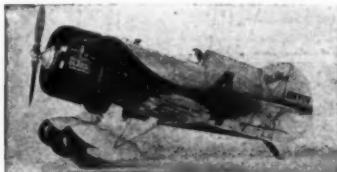
BERLINER-JOYCE P-16

This unusual airplane, the prototype of which is hailed as the first successful American two-seater pursuit design stationed at Selfridge Field, Michigan, was also modeled after repeated requests by a great many of America's model enthusiasts, both men and boys alike. We now offer you a kit to build this very unusual airplane capable of especially fine flights of distances far greater than those obtained on test flights of a hundred feet with motor partly wound. Its span is 25 1/4", length 22", weight 3.9 oz. Colored the standard army yellow wings and tail surfaces, balance olive drab, with black details. Kit comes complete as shown the C all printed out wood and parts and a very fine complete detailed full size authentic C-D drawing, another one of the famous Cleveland-Designed line enabling American model aircraft enthusiasts to build those widely known master models. Complete Kit SF-39 at dealer's or postfree, only

\$3.00

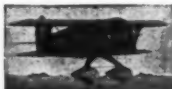


Four Modern "Racing"



1931 BAYLE'S GEE-BEE (Re-Designed)

There's absolutely no comparison between this and our original Bayle's Gee-Bee. Everybody's beginning to rave about it. Be sure to get it—as you'll prize it very highly for your line-up of Thompson Trophy winners. 1/2" scale. Colored yellow and black. Span 17 1/2", length 15", weight 1.4 oz. Complete Kit SF-17B (with everything including printed out balsa but without pilot) at dealer's, or postfree \$1.75.



1931 Doolittle's Laird Super
Solution. Span 15 1/2", length 13 1/2", weight 1.7 oz. Colored yellow and green. Kit SF-5, \$2.25.



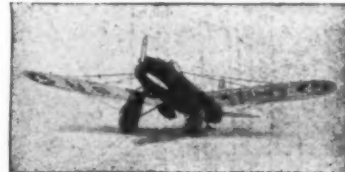
1931 Supermarine S6-B. Span 22", length over all 21 1/2", weight 2.9 oz. Colored silver and blue. Kit SF-19, \$2.25.



1930 HOWARD RACER (Re-Designed)

All Howard enthusiasts will want this much finer, classier re-designed model. In fact, all model lovers will get a thrill building this printed-out set. Beginners will find it simple to build—experts will thrill at its detail, and realism. 1/2" scale. Colored all white, black details. Span 15", length 13 1/2", weight 1.3 oz. Complete Kit SF-18B (everything including printed out balsa and block for pilot) at dealer's, or postfree \$1.50.

Seven Modern "Military"



1931 CURTISS A-8 ATTACK PLANE

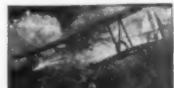
All the flying zip, extreme maneuverability and death-dealing accoutrements of America's new "terror of the sky" are packed in this master model job in true Cleveland-Designed thoroughness—detailed to the last feature—machine gun, windows, gas tank, wing flaps, dummy motor, incidentals, venturi, and pitot tubes, etc., etc. All balsa wood supplied is printed out and numbered. This simplifies and authenticates construction—merely cut out numbered parts and assemble 'em. This Kit, as all Cleveland-Designed Kits, contains everything needed. Also includes the new Cleveland enamel dopes, which give it that new finish everyone is talking about. Authentic 1/2" scale. Span is 33", length 24", weight 4.7 oz.; colored Army yellow and olive drab. Complete Kit SF-25, postfree \$3.25.



1931 Curtiss Helldiver. Span 23 1/2", length 16 1/2", weight 2.7 oz. Colored blue and silver. Kit SF-7 (while they last) \$1.75. (Originally \$3.50).



1931 Polish P-6 Fighter. Span 25 1/2", length 17 1/2", weight 2.5 oz. Colored all silver. Kit SF-6 (while they last) \$1.75. Originally \$2.95.



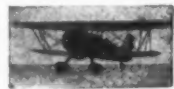
1932 Hawker Fury. Span 22 1/2", length 19 1/2", weight 2.6 oz. Colored all silver. Kit SF-26, \$2.25.



1932 Curtiss F9C-2. Re-designed with dirigible hook attachment. Drawings permit making either old or new design. Span 18 1/2", length 15 1/2", weight 2.2 oz. Silver and blue. Kit SF-22, \$2.00.



1932 Boeing P-26. Formerly XP-38. Span 21 1/2", length 17 1/2", weight 2.5 oz. Yellow and olive drab. Kit SF-23, \$2.00.



1932 Curtiss Hawk P-6-E. Span 23 1/2", length 16 1/2", weight 2.3 oz. Colored yellow and olive drab. Kit SF-21, \$2.25.

Just Off the Press!

Issue No. 5 of CLEVELAND MODELMAKING NEWS And Issue No. 6 will be ready around November 15th. 25c each. Be sure to get both issues—packed with authentic full size drawings, valuable ideas and suggestions every modelmaker needs. Send 50c at once if you wish to receive both copies. Earlier issues still available at 50c per copy. Foreign customers, add 5c per issue to above price.

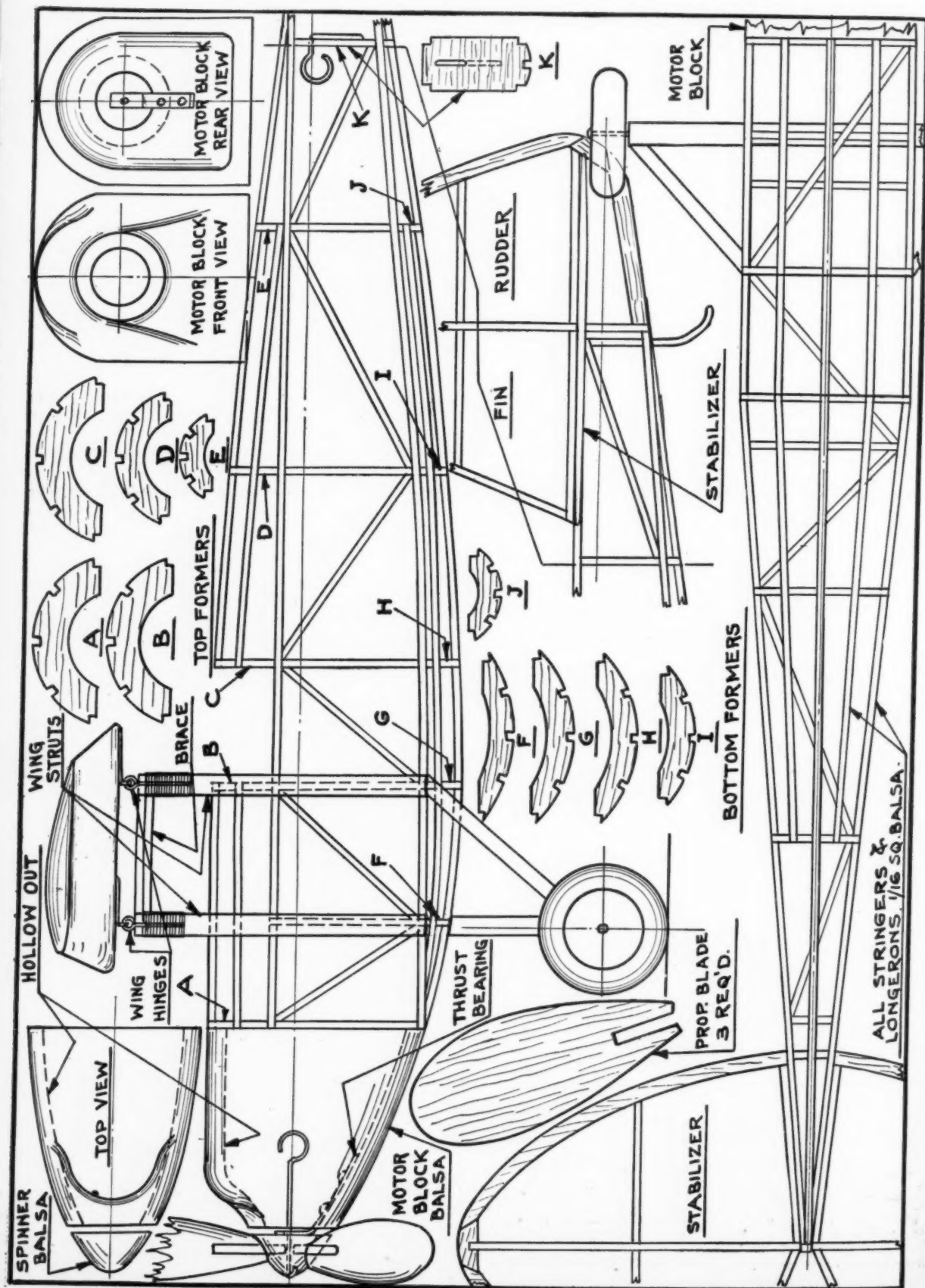
Get Him for You—Please See Him First!

Use money orders or checks. No C. O. D. order accepted. CANADIAN AND FOREIGN CUSTOMERS: Our prices are in U. S. dollars and cents. Be sure to remit the proper amount of your money to equal this standard. Customers in Canada and British Isles add 15%; all other countries add 25% for Foreign Service charge. All Foreign Customers—be sure to add 25% extra on Kit SF-35, and inquire of steamship companies rates of delivery to your city.

Send 3c Stamp for New Catalog, No. 12

—Recognized throughout the
and Manufacturers of Kits of
Navy and Commercial Models.

1866NM W. 57th ST., CLEVELAND, OHIO, U.S.A.



Build This Pivot Wing Plane

A New Idea that Will Afford You Many Hours of

Interesting Experiment and Increase

Your Knowledge of Aeronautic

Principles

By BARNETT FEINBERG

Idea by FREDERICK MOY

WE HAVE a novelty in the way of airplane construction in aiding lateral stability. It is an experiment but great advances in aviation have come from just these kinds of experiments.

It is claimed that by using movable wings the wing will automatically bank when making turns but the body stays level. For this purpose we have used a Heath type of fuselage body for our experiment. Try out this plane on your work-bench. Drawings are given here that will enable you to complete this ship with the help of a little patience on your part.

Body—Its Construction

Make a simple sketch of one side of the fuselage as shown by the double lines on the side view. It is not necessary to sketch more than the longerons, laying the longerons so that all the parts are within the drawing itself. Build two complete sides with all the upright pieces cemented to the longerons and with bulkhead (K) in place. When these are thoroughly dry, fit and cement the cross pieces to the correct length.

After the top cross braces have been assembled into their respective positions and allowed to dry, the body formers are drawn and the balsa parts cut to conform to the pattern, allowing a small margin which can later be sanded to a perfect fit.

These formers should be fitted one at a time starting with the top former (A) and continuing to (E). After these formers are cemented in place and dry, fit in place the bottom formers beginning with (F) and continuing to (J).

The next step on the body is to add the longitudinal fairing strips. Three fairing strips are placed equally between the top and longerons and three between the lower longerons. The center fairing strips continue to the end of the body while the rest terminate at former (E) for top stringers and at former (J) for bottom stringers.

The fairing strips are 1/16 sq. and each piece is sunk into the former to the proper depth. The tail skid is made from 1/16 diam. reed and is cemented to the upright end.

The body has now been completely assembled and is ready to receive the landing gear, motor and tail parts.

Stabilizer and Elevator

A full size layout showing the construction of the stabilizer and elevator is drawn up. Two of these are required, one right and one left. They are cemented to the sides of the top longerons and braced by wires leading from the fin, and at the bottom from a brace wire from the lower end of the fuselage.

Power

It is powered by four strands of 1/32x1/8 flat rubber. If model is a trifle heavy, another strand may be added.

Rudder

The rudder is constructed in a similar fashion. The size of materials used in the rudder is the same as those used in the stabilizer, 1/16 sq. balsa and 1/16x1/8 balsa pieces.

Landing Gear

The landing gear rear struts are attached to the lower longeron and directly against an upright and cross brace at former (G). The front struts of the landing gear converge to the center of the body at former (F). The axle of the wheel is made from a pin or No. 10 music wire and is cemented and wrapped with silk thread to the front strut.

Motor

The shape of the engine cowling is shaped from a balsa block and hollowed, leaving a wall thickness of approximately 3/16". The thrust bearing which supports the propeller hook and is attached to the front part of the block is made of 1/32 metal bent at one end and tacked at the center end to the wood with two small pins or brads.

Propeller

THE propeller for this model should be approximately 5" in diameter and three bladed. The pitch should be medium. A spinner made of balsa block with 1/8" diam. reed dowels inserted and cemented. The other end of the dowel is fitted into the slot of the propeller blade and cemented. The dowels are placed equally or 120° apart. A hook made of No. 10 music wire is inserted through the center of the spinner and bent over. The hook at bulkhead (K) is also made of No. 10 music wire and inserted through the bulkhead and bent over.

Wing

The wing has one 1/16x1/8 spar placed on top of the ribs. The leading edge is 1/8 sq. balsa and shaped. The trailing edge is 1/16x1/8 balsa. The ribs are all cut from 1/16 balsa. The wing tips are made from 1/16 balsa and rounded. Wing hinges are cemented in front and rear at the bottom of the center rib (No. 1). This is done before the wing is covered. The other part of the hinge is wrapped and cemented to the brace struts. The dihedral extending from the center ribs (No. 1) to each end of the wing is 3/8".

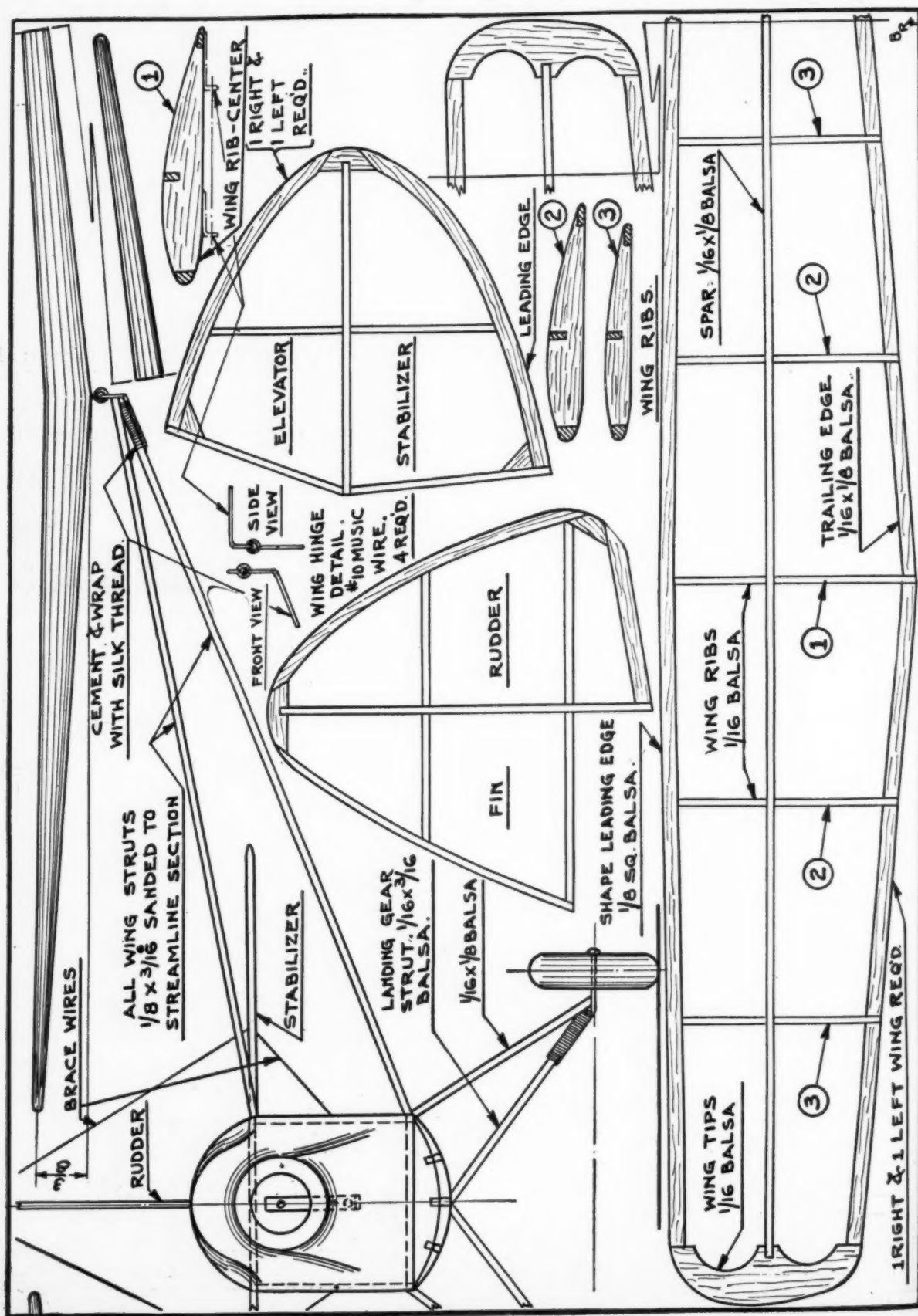
Wing Struts

The wing struts of which there are eight (four on each side), are made up of 1/8 thick and 3/16 wide balsa. The upper brace struts are attached to the upper longerons and the lower brace struts to the lower longerons. They converge at the center end and are braced crosswise by 1/16x1/8 piece of balsa, thus connecting the front and rear struts.

Covering

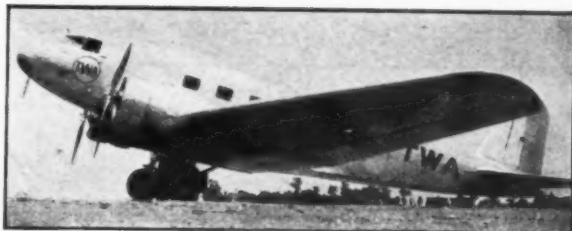
After the body, wings, stabilizer and rudder have been covered, they should be sprayed lightly with water so that the tissue will shrink snugly over the framework. The body is covered with numerous strips running fore and aft. After the body has been completely covered, the stabilizer and rudder are attached in their respective places.

As this is a new type of ship, a little experimentation will be required in order to determine correct adjustments and methods of flying the plane. Use your head and increase your knowledge of flying. Good luck.





The Cessna Racer, Chicago, by C. Kossack.



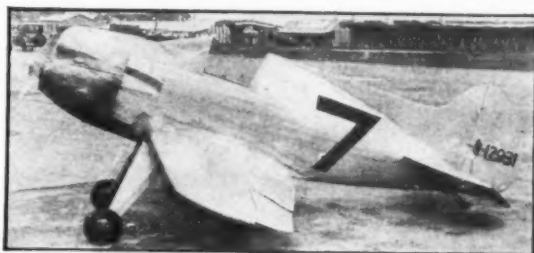
The new 206 m.p.h. Douglas, by A. I. Whitmer.

'Shots' from the I.A.A.P.E.

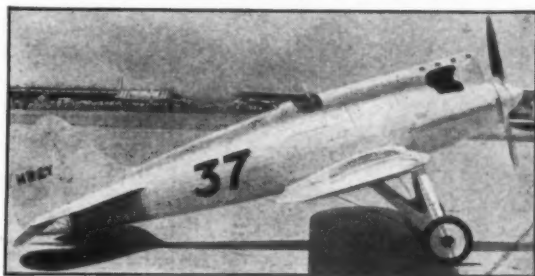
OUR bulb squeezers have been busy in various parts of the country. Here are a few high lights of their activities.

E. I. Shyroch of Pittsburgh, well known photographer of aviation personalities has been accepted into the Club. Shyroch has personally "shot" most of the most famous and is well known for the quality of his work.

Art Whitmer, Walter Sharp and Bob Hare, all of California, "covered" the N.A.R. at I.A. for the Club—"Chuck" Kossack and prospective member Brinly, "covered" the Chicago affair. A very good range of "types" were shot by all. Two members whom Chuck met at Chicago were Al Schmidt from Kansas City, Mo., and Ed Shyroch of that famous town of Wilkinsburgh, Pittsburgh, Pa. Chuck showed the boys around and was a great help. We're sure that if he has occasion to visit the home town of either Al or "Daddy" Shy in Pa., he will be treated

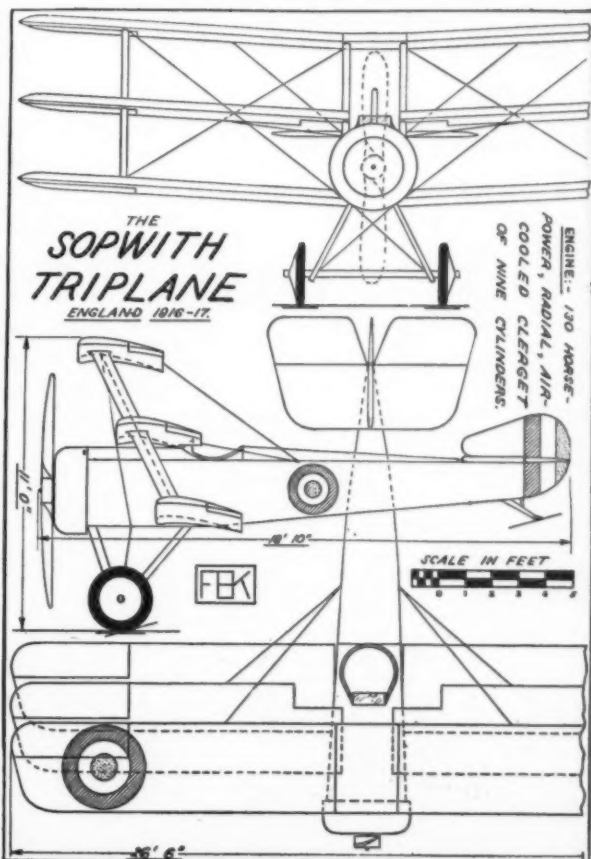
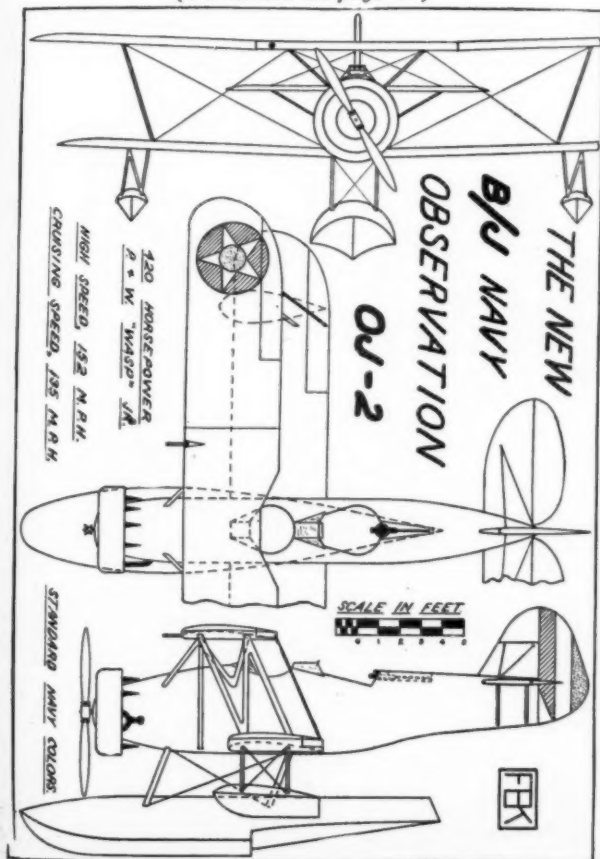


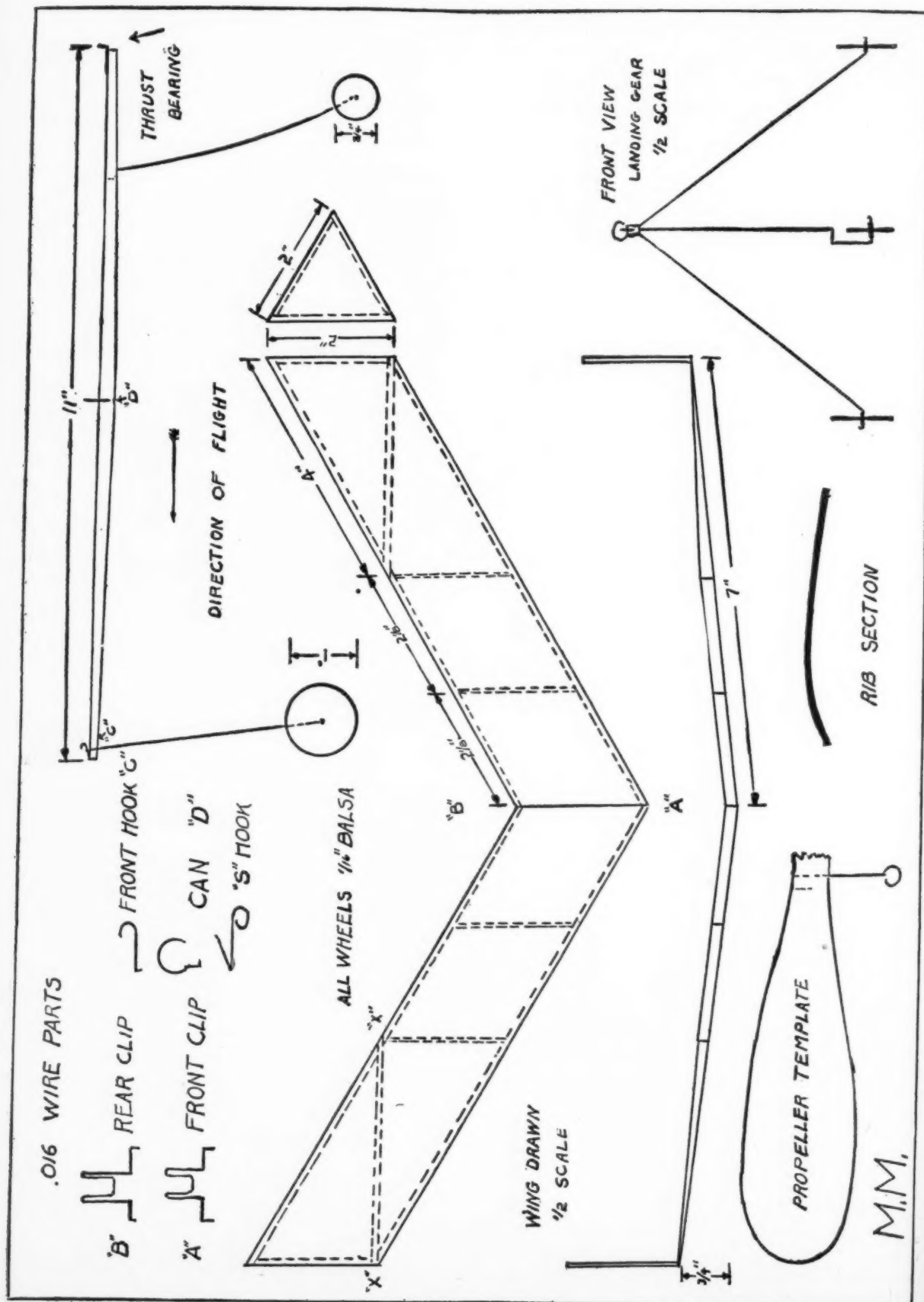
The Tilbury Fundy Flash, by C. Kossack.



A Howard Racer, Chicago, by C. Kossack.

(Continued on page 45)





How To Build a Tailless Plane

HAVE you often wanted to experiment with an odd type of airplane? If so, then you will enjoy making this interesting and successful model of a tailless airplane. It is a very high and consistent flier, often reaching 100 to 200 foot altitudes and remaining in the air 80 to 120 seconds.

The plane was designed primarily for flying outdoors. It therefore at first may appear to be a trifle heavy but experience however, has proven that it is better to build it exactly according to instructions, unless one may desire to make the plane entirely for indoor flying, then it can be lightened very materially.

All of the drawings are one-half scale except the irregularly shaped parts, and the propeller template. The wood used is a medium hard grade of white balsa.

You will need only the following small list of materials to build this tailless airplane.

- | | |
|--|---|
| 1 Motor stick $\frac{1}{4} \times \frac{1}{8} \times 11"$ | |
| 1 Sheet $\frac{1}{16}"$ balsa for wings and wheels | |
| $\frac{1}{4}$ sheet tissue paper (Superfine) | |
| 1 Propeller Block $\frac{7}{8} \times \frac{5}{8} \times 6"$ | |
| $\frac{1}{2}$ oz. Banana Oil, | |
| $\frac{1}{2}$ oz. Airplane Cement | |
| .016 Wire, | 3 Small Bushings |
| .014 Wire | 2 ft. $\frac{1}{8} \times 1/32"$ rubber |
| 2 Washers | and some rubber lubricant. |

Wing

To make the wing, first draw it full size on a sheet of paper. Build your entire wing on this full size plan so that your wing will be true to size. The complete wing is made of $\frac{1}{8}" \times 1/16"$ balsa except for the five ribs, which are made of $3/64"$ square balsa. The ribs may either be bent or cut out with a metal template made of tin or aluminum.

Note that the stabilizing area, that is, the area behind the line X-X on the wing drawing has no rib section. After the complete wing framework is built with the exception of the two wing tip rudders, it should be allowed to dry for at least one-half hour. It may then be given the proper dihedral angle. When this in turn is dry, it is covered in two sections with superfine tissue. Then the two equilateral triangles that form the rudders are built directly on each wing tip. When the rudders are dry, each one is covered on the outside with the superfine tissue.

Make certain that both rudders are parallel and are not warped in any manner. The paper with which the wings and rudders are covered should not be shrunk or doped. The paper however should be put

A Plane of Odd Design That Will Give Exceptional Performance and Provide Means for Experiment

By MARSHALL MULVANY



The tailless model in flight well above the roof of a nearby building.

on with great care so that it forms a good airfoil section. If you desire you may press the sheets of paper ahead of time between magazines to remove all of the wrinkles and creases.

The next step is to make the two clips. "A" and "B" from .014 music wire as illustrated in the plans. After these are fixed to the top of the wing in the position shown in the plans, the entire wing is then complete.

Fuselage

THE fuselage stick which is $\frac{1}{8}" \times \frac{1}{4}" \times 11"$ is tapered so that it is $\frac{1}{8}" \times \frac{1}{8}"$ at the ends and $\frac{1}{4}" \times \frac{1}{8}"$ at the center. When this is done, then fasten on the stick, the thrust bearing, can and rear hook. While this is drying the wire landing gear may be bent from .016 music wire over the full sized plans. The wheels may also be made at this time from the $1/16"$ sheet balsa.

It is advisable to put a small bead or aluminum bushing in each wheel. This will permit a fast and graceful take-off. The landing gear is then installed on the fuselage as shown in the plans. Make certain to check, that the model when pushed along rolls in a straight line, for if it does not, it will very likely turn over on the take-off.

Propeller

The propeller is the third important unit on this model.

It is carved from a block $\frac{7}{8}" \times \frac{5}{8}" \times 6"$. First, draw diagonals on the block and carve it in the regular manner. When the propeller is done, shape the blades with the aid of the propeller template. After it is balanced, the propeller shaft is inserted in the opposite direction from that of the tractor propeller, that is the hook part of the shaft extends out from the leading edge of the propeller, thus making it a pusher type of a propeller.

General Assembly

After the model is assembled, it is necessary to find the right negative angle at which to set the stabilizing areas. This can only be determined by flying the model. It is on most models, between a negative 3 or 4 degrees.

The model can be made to circle in either direction or its angle of climb changed, simply by changing the angle in either or both stabilizers. Do not try to adjust the model with the rudders. Another point for those who desire to obtain long duration flights is to use a heavier grade of $\frac{1}{8}"$ flat rubber with rubber lubricant.

This model has a high climbing angle and also a flat gliding one. Combined with this feature it makes a wonderful flying model.

You will be pleased with the results.

Aviation Advisory Board



Conducted by
CHARLES HAMPSON GRANT
Chairman of the Board

Formerly of
The Technical Section, Air Service, U. S. Army

LAST month it was necessary to break off in the middle of answering several questions sent in by Edward T. Radtke of 3731 North 24th Place, Milwaukee, Wisc. We are pleased to continue here.

Question: Should the center of lift be approximately over the center of gravity in the case of swept-back wings?

Answer: Yes. Sweeping back the wings make a difference in this respect. However, be sure you know how to determine the center of pressure of swept-back wings. The center of pressure of sweptback wings is at a point on the center of the line which joins the center of pressure of the right and left half of the wing.

William Rubenstein of 1014 Home Street, Bronx, New York, has a few questions to ask.

Question: When building a scale model from aluminum tubing, should ambroid, solder or glue be used?

Answer: It is best to use solder if you can obtain a solder which will satisfactorily adhere to aluminum. However, this is usually very difficult. We suggest that some metal cold solder be used. There are several brands on the market. One is Alumoweld. If you cannot get this, ambroid is the next best thing.

Question: On a scale non-flying model, can you cover it with some other material beside silk and yet get the same finish?

Answer: We suggest using some other material similar to silk, such as rayon or voile.

Question: Do you cover it the same way as if you were covering it with tissue?

Answer: You do not cover the plane with silk in the same manner as you do with tissue. The best way in which to do this is to tack your silk on three sides to some flat surface, so that it is perfectly smooth. If you are covering a wing, slip the wing under the silk from the side which is not tacked down. When the wing is in position, tack down the fourth side. The silk is then stretched smoothly over the surface to be covered. Proceed to cement the silk to the wing by cementing it to the outside edges of the wing. Do not cement it to the wings. After it is thoroughly dried,

cut the silk close to the wing and cement down the rough edges of the silk.

J. Morely Jackson of Bloomfield, Ontario, Canada, says he has been a model builder for a number of years. However, he has confined his model activities to model railroads and subjects outside of the model airplane field but the mystery of model airplane design has finally demanded his attention. He asks:

Question: Can you tell me where I can get some data and photographs of a Bellanca Sky Rocket?

Answer: For the benefit of all model builders, we suggest the following. For plans, photographs or construction details of large ships, write to the manufacturers. If you cannot obtain them from this source, we suggest that you make it your business to find out where any particular ship is located, possibly at some airport. Then make photographs of it and examine them for yourself. You will find this not laborious but a great pleasure.

QUESTION: Where can I obtain supplies for model building?

Answer: Any one of the advertisers that appear in our magazine who carry model airplane supplies in stock, will be very pleased to supply you with material.

Question: Is banana oil satisfactory as a clear dope as well as an adhesive for the covering of a model plane?

Answer: Yes. Often banana oil is used to cover and tighten the paper on model planes.

Question: Is Japanese tissue the most suitable covering for the scale model? (Continued on page 46)



The new Vought Corsair V-70, a two seater, high performance biplane. Span 36 ft. 10 in., wing area 325.6 square feet. It has a high speed of 174 m.p.h. and an initial climb of 1650 feet per min.

SELLEY'S EXCITING XMAS VALUES

TALK ABOUT BARGAINS!
Genuine Selley Kits
Postage 10c

2 EACH (1 or 2)
REAL FLYERS! 14" Wingspan

Like all SELLEY kits they are complete with all materials full size plans and complete building instructions.

Six Beautiful Models

AERONCA
BUHL BULL PUP
FAIRCHILD
HEATH PARASOL

BUHL BULL PUP
CURTISS NAVY
RACER
VERVILLE AIR COACH




The Choice of the United States Government
COMMERCIAL CONTEST MODELS

50¢

These new models are **SENSATIONAL** in their flight performance. Flights over 300 feet are guaranteed with these snappy large Long Distance Flyers. With their large slow turning Propeller and bright colors, these models are the choice

of the most critical model builder. Each Kit is complete with special turned parts, printed Balsa sheet, balsa spray, Colored Jap paper, rubber cement, insig-

EACH
Postage 10c ea.



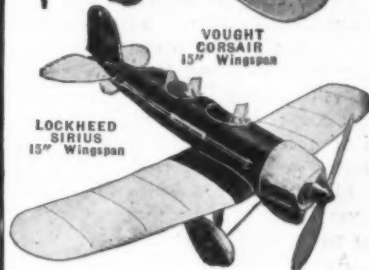
BOEING P12
19" Wingspan



HAWK PGE
15" Wingspan



VOUGHT CORSAIR
15" Wingspan



LOCKHEED SIRIUS
15" Wingspan



BAT
18" Wingspan



SWALLOW
18" Wingspan



SPORTSTER
18" Wingspan

HERE, TRULY, IS THE BIGGEST VALUE EVER OFFERED IN AUTHENTIC SCALE FLYING MODELS!

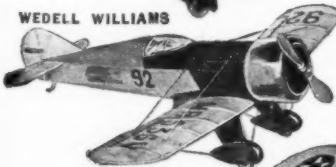
95¢ EACH
Postage 15c

ALL 18" FLYING SCALE MODELS

These beautiful, speedy, Selley masterpieces embody a new, simplified method of construction—the "Bi-Form Method." Complete with full-sized 8-view plan, special machine turned balsa cowl, props, hub wheels, etc., cement, music wire, reed, bamboo, balsa sticks, insignia, etc. What a bargain!



CURTISS A-8 ATTACK



WEDELL WILLIAMS



BOEING



GEE-BEE SUPER-SPORTSTER



NORTHROP GAMMA

The Gifts That Thrill!

The World's Best Model Kits are Inexpensive Today!

CURTISS WRIGHT SERIES

FLYING FALCO
\$1.25



18" Wingspan

BELLANCA AIRBUS



14" Wingspan

\$1.25

Space Prohibits Illustrating these:
FLYING HELLDIVER, 24" Span \$4.00
BELLANCA SKYROCKET, 14" Span \$1.00

REPLICA MODEL KITS

12" Wingspan

HAWK \$1.00 **HELLDIVER \$1.00** **FALCON \$1.00**
CONDOR, 34" Span \$7.00
CURTISS HAWK, 25" Span \$5.00
MYSTERY 13", 23" Span \$5.50
SPAD \$1.25 **ALBATROSS \$1.25**
FOKKER \$1.25 **NIEUPORT \$1.25**

READ THIS FOR YOUR PROTECTION

Every SELLEY product is guaranteed to be the best obtainable and is manufactured in the largest and most modern factory in the world. You may safely choose any construction set or accessory and if it does not meet with your entire satisfaction your money will be immediately refunded! Every SELLEY product is guaranteed to be the best obtainable—SELLEY ALONE CAN MAKE THIS BROAD GUARANTEE!

SELLEY MFG. CO., Inc.
1373A GATES AVENUE, Dept. 12
BROOKLYN, NEW YORK CITY

WHY I LIKE TO BUILD MODEL PLANES AND WHAT MODEL PLANES I LIKE TO BUILD

A Contest You Can Win

Sponsored by Universal Model Airplane News

DO YOU know why you like to build model planes and what planes you like to build? If you do, you may win an autographed copy of the latest model book by **Edwin T. Hamilton**.

All you have to do is to write us a letter and tell us. The title at the top of the page should be the theme of your letter.

A copy of the most complete treatise on model airplane building will be given to each one of the writers of the five best letters received by us before December 1st, 1933. If you wish to know how fine this book really is, read the review of it appearing on this page, by the editor of Universal Model Airplane News.

The winners will be judged by the neatness and the comprehensiveness of their letters. The judges will be Mr. George C. Johnson, Publisher; Mr. Edwin T. Hamilton, Author; and Mr. Charles H. Grant, Editor.

Be sure to give the following information at the bottom of your letter, otherwise your letter will not be considered as an entry in the contest.

Your name, address, age, date of your birth. How long have you been building planes?

Get busy now. It is easy and you may win.

DO YOU KNOW—?

By **ORVILLE H. KNEEN**

THE U. S. Army did not have a single war plane when we entered the war (our planes were all obsolete because of rapid development by the fighting nations). Not a factory was building suitable war craft in this country. We had to call upon the Allies for all the important details of war aircraft and learn how to build them.

The DeHavilland 4, a two-seater, observation or bombing plane, made in England, was chosen as most suitable for production in this country, to utilize the Liberty motor then being developed.

However, not a single manufacturer was found able, willing and equipped to produce such craft, even when plans were to be provided by the government. Finally the National Advisory Committee for Aeronautics was organized, which created the Aircraft Board, and Congress appropriated 640 million dollars for an aerial program—the greatest single appropriation for a specific purpose ever made by any country.

The J-N-4-D of the Curtiss Company, and the J1 of the Standard Aeronautics Corporation were selected as best suited for training planes. Over a dozen firms were selected to produce them. By June, 1917, six had been delivered—the entire output of the United States! But at the end of the first year of our program, over 4,000 of these planes had been delivered, sufficient for primary training at our forty flying fields, reaching from coast to coast.

By the end of the war the aerial branch had 2,161 officers and 22,351 enlisted men, a total of 24,512 at the front, with even more behind the lines, and about 33,000 in the Service of Supply.

The first Liberty motor was produced in May, 1917, and the first 12-cylinder Liberty was flown successfully on Oct. 21, 1917, in a Curtiss flying boat.

IT was not till April 8, 1918, that the first fully equipped military plane of American manufacture was flown at the front. It was strongly criticized by war pilots at the front. Its radius of flight endurance was only two hours. The pilot's observation was hindered by poor seating, as was his firing. The tail was structurally weak and parts not well balanced. The linen fabric sometimes ripped off in flight.

However, these defects were remedied. By the end of the war the A. E. F. had 45 aero squadrons at the front, two equipped with American built planes (de Havilland); 767 pilots, 481 observers, 23 aerial gunners.

854 enemy aircraft (781 airplanes and 73 balloons) were driven to destruction by American airmen and officially accounted for, exclusive of many others known to have crashed so far behind the enemy lines that official confirmation could not be obtained.

American aero squadrons took part in 150 bombing raids, dropping 275,000 pounds of explosives. Our total loss were 289 airplanes and 49 balloons.

39 American pilots received the French Cross of the Legion of Honor, 158 the French Croix de Guerre, four the Congressional Medal of Honor (highest award in the United States), two received the British Distinguished Service Cross, and twenty the British Distinguished Flying Cross.



COMPLETE MODEL AIRPLANE MANUAL

By **EDWIN T. HAMILTON**

Harcourt, Brace & Co.

THERE has been great need for a complete and simple presentation of practical methods of Model Airplane construction and information essential to a complete understanding of these methods. It is a pleasure to recommend Mr. Hamilton's latest book as one which completely fills this need. Without question it is the most complete and exhaustive book on model airplane construction, written and published to date. A large part of its value also lies in the understandable manner of presenting the subject. It is a value to the amateur for this reason and to the expert because it presents the latest word and picture encyclopedia of model plane construction.

Its treatment of the subject is exhaustive inasmuch as the author presents not one or even two methods of constructing the various parts of all types of model planes, but gives all the various ways of making each with studied recommendations, but at the same time leaving the choice with the reader. Tools and materials are fully explained.

One hundred and twenty of the most important manufacturers, transports, Army, Navy and World War insignia are given, together with full instructions on transferring them to models. Paints and painting, accessories, methods of launching, winding and flying every known type of model, together with chapters on reading and using plans, model carrying cases and short cuts in construction are fully illustrated and explained.

Mr. Hamilton has added many unique and novel devices for simplifying the building of models, together with long chapters all fully illustrated, on building wings, fuselages, propellers, landing gears, engines, cowlings, motors, motor sticks, metal fittings and assembling of models.

The remainder of the book is taken up with sixty-sixty models from simple gliders to beautiful examples of built-up, flying scale replicas of real ships. Such unique additions as his "All-in-One" model will create experimentation in model building possibly more than anything else. With this model, the builder completes only eleven parts, but with them can assemble fifteen flying models. All curved portions of each model are shown on graph, eliminating all possibility of error on the part of the builder. Three and sometimes four views of each fuselage are shown in plan.

(Continued on page 46)

New Broadfield Quality Products

BLUE EAGLE

COMMERCIAL
FLYING MODEL
KIT

Price
\$1.00
Postpaid



24"
WING
SPREAD

Exceptional Features

Adjustable Wing New Type Clips
Sweepback Wings
Die Cut Ribs
Propeller With Shaft Attached
Celluloid Wheels
Etc., Etc.

Boys! Here is a brand new type of construction kit that is easy to build. Especially designed for the model builder who demands quality kits with exceptional flying performance. Sweepback wing adds to its stability. Features: Adjustable wing new type clips—allows adjustment of main wing without the use of rubber bands. Wing releases free from body when hitting obstruction, thus avoiding breakage.

THIS KIT CONTAINS

Grade "A" White Balsa Sticks cut to exact size.
8" New Type Propeller assembled ready to finish.
Celluloid Wheels 1 1/4".
Superfine Silk Tissue.
Die Cut Ribs.
All Wire Parts Correctly Formed.

Ambroid Cement.
Banana Oil and Brush for applying.
Full Size Drawings and Complete Instructions
for assembling.
Rubber Meter S Hooks, Etc.

SATISFACTION GUARANTEED. ORDER THE BLUE EAGLE NOW AND YOU WILL GET A NEW THRILL WHEN YOU BUILD AND FLY THIS NEW FEATHER WEIGHT COMMERCIAL. ORDER DIRECT FROM FACTORY NOW

NEW BROADFIELD GLIDERS

"FAMOUS FOR
FLIGHTS"



AT DEALERS OR
DIRECT

1 No. 54 10c

1 No. 64 15c

1 No. 65 25c

Sent for 50c

P. P. 10c

No. 65
18" Wing
25c

No. 54
12" Wing
10c

BOYS! Its great fun flying these high performance sailplanes—loop the loop, etc. Made of finest Balsa Wood—cambered Wings, easy to assemble, wing, etc. Held in body by slots. Wings brightly imprinted with insignias.

DEALERS

QUICK SELLING ASSORTMENT

| | |
|--|------------|
| 2 doz. No. 54 Glider | retail 10c |
| 1 doz. No. 64 Glider | retail 15c |
| 1 doz. No. 65 Glider | retail 25c |
| No. 1 ASSORTMENT COST POSTPAID \$3.40—YOUR PROFIT \$2.25 | |

REMEMBER—Today's Glider Customers are Tomorrow's Model Builders
Cash In With Broadfield's Quality Gliders—and Be Assured Satisfaction

Here are new Broadfield exceptional high performance gliders, your younger fellows will have great fun flying. Made of selected balsa with cambered wings. Packed knocked down. Wings, etc., held in place by slots in the body and are quick to assemble. Wings attractively imprinted with bright colors and N. H. A. insignia. Boys! show this advertisement to your dealers and they will be glad to order them for you.

ORDERING INSTRUCTIONS

On all orders west of the Mississippi river add 10% to cover postage.

DEALERS WRITE FOR PRICES—L.I.s VISIT OUR RETAIL MODEL SHOP

BROADFIELD MODEL AEROPLANE CO.

99 YALE STREET,

HEMPSTEAD, NEW YORK



ZOOM SOARING GLIDER

Built
Ready to
Fly



75c each
Postage 15c
20" Wing Spread

Oh! Boy—What a Soarer—What Performance—throw it against the wind and watch it zoom high in the air—strongly constructed like a contest glider—selected Balsa, Cambered Wing—all surfaces smoothly sanded. N. H. A. insignia on wings. Satisfaction guaranteed. Ask your dealer or order direct from factory.

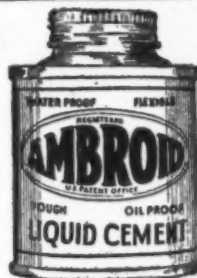


"ZOOM" SOARING (ALL BALSAS) 35c

Here is a quality glider kit that builds the glider pictured above, a real contest soarer. Picture above shows cut to shape parts ready for quick and easy assembly. Only finest grade "A" balsa used. Full instructions and all necessary materials come with each kit.

Ambroid

BUILDS
LIGHTER
AND
STRONGER
MODELS



For over Twenty-five years Ambroid Cement has been used by model builders because of its superior strength and durability. It takes less Ambroid on every joint thus saving weight and being sure of a stronger job. Dries a little slower but holds longer. Particular builders are now using genuine Ambroid. It will pay you to use only the best. By actual test Ambroid is stronger than ordinary "clear cement". Order some now and prove its strength.

AMBROID CEMENT

| | | |
|----------------|-----|------------|
| 1 1/2 oz. tube | 25c | Postage 5c |
| 2 oz. bottle | 25c | Postage 5c |
| 4 oz. can | 45c | Postage 5c |

Best by test Broadfield Original

Wonder Stripper



PRICE
50c

Postpaid
in
U.S.A.
Original
Balsa
Wood

WONDER STRIPPER

Improved Broadfield Giant Chicadee

75c Post
paid

Boys—Here it is again at a new low price. The famous high climbing Giant Chicadee 15" R. O. G. A remarkable outdoor flyer that gives you real performance. Balsa fuselage, wing spars, etc. cut to exact size. Semi-finished new type propeller. Formed wire parts. Die cut balsa ribs, Celluloid wheels, Cement, Banana oil and full size plans, etc. Dependable endurance model that has flown over seven minutes. Simple to build and easy to fly.



VIKING'S NEW SUPER-QUALITY KIT and GIANT PLANS

Viking's kits enable you to build BIG, AUTHENTIC scale models that really FLY. These models are the result of careful engineering, many flight tests, and the BEST MATERIALS. All kits include aluminum wheels, lots of cement, 4" bottle of dope, colored tissue,

turned cowlings, complete insignia, extra rubber, selected balsa, etc. All kits have very clear plans, detailed instructions, and unique patterns.—The best kits at any price and our MONEY BACK GUARANTEE insures your satisfaction.



24" HAWK Super-Quality Kits

Add 10c for postage, 15c West of Miss. and in Canada.

General supply catalog 5c

| | |
|--------------------------|--------|
| 24" Curtiss Hawk P-6 | \$1.25 |
| 24" Fokker D-VII | 1.15 |
| 25" Boeing 247 Transport | 1.30 |
| 30" Boeing Bomber | 2.25 |
| 20" Boeing P-26 | 1.00 |
| 20" Boeing P-12F | 1.25 |

VIKING AIRCRAFT CO., Dept. I-C, Hamilton, Ohio.

25" BOEING 247

| | |
|-------------------------|--------------------------|
| 3 for 50c, 10c postage— | 25" Akron Fighter P-9C |
| 18" Ben Howard's Ike | 24" Bellanca Seaplane |
| 20" Boeing P-26 | 20" Boeing P-12F |
| 30" Boeing Bomber | 25" Boeing Transport 247 |
| 30" Curtiss A-8 Attack | |

Giant Plans

| | |
|------------------------|----------------------|
| 20c each 5c postage | 24" Curtiss Hawk P-6 |
| 30" Curtiss Hell Diver | 24" Fokker D-VII |
| 20" Gee Bee | 24" Lockheed Orion |
| 18" Nieuport 28 | 20" Polish PZL-6 |
| 20" Wedell Williams | |

Dealers, Distributors, write for discounts.



6-inch Scale Model Kits 2 for 35¢ postpaid

(If insured 5c extra)
Including scale drawing, instructions, balsa wood, 2 wheels, metal prop., sandpaper, cement and lacquer. Your choice of the following 24 snappy models:

| | |
|------------------------------|------------------------------------|
| NC 1 Gee-Bee Sportster | NC 13 British Supermarine |
| NC 2 Lockheed Sirius | NC 14 Hawkes' Sky Chief |
| NC 3 Wedell Williams Racer | NC 15 Boeing Multi Motor Transport |
| NC 4 Heath Parasol | NC 16 Boeing P-26 Pursult |
| NC 5 Lockheed Vega | NC 17 Curtiss A8 Shrike |
| NC 6 Fairchild 24 | NC 18 Pittsair Auto Giro |
| NC 7 Boeing Pursult | NC 19 Vought Corsair |
| NC 8 French Breguet | NC 20 British Gloucester Fighter |
| NC 9 Pittsair Super-Mallwing | NC 21 Bristol Fighter |
| NC 10 Curtiss Pursult | NC 22 German Fokker 1918 |
| NC 11 DeHaviland Gypsy Moth | NC 23 Nieuport 1918 |
| NC 12 Curtiss Fledgling | NC 24 Spad 1918 |

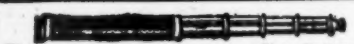
10" Construction Kits 35¢ postpaid

| | |
|---|--|
| NC 51 Boeing Transport... world's fastest multi-motored transport | |
| NC 52 Curtiss Condor... new twin-motor biplane, N. Y. to Washington service (10-Mile range) | |
| NC 53 Sikorsky Amphibian... Pan-American Clipper ship, 4 propellers | |
| NC 54 Northrop Gamma... Hawkes new speed ship | |
| NC 55 Boeing P-12... new service biplane | |
| NC 56 Curtiss Hawk... great army favorite | |

PAUL K. GULLOW

Wakefield

Mass.



Big 3ft. Telescope

Five Sections. Brass bound. Study Moon, Stars and distant objects with this powerful 8-X instrument. Special Eye Piece for viewing Sun. Included FREE. Makes an ideal microscope. Guaranteed. Big value. Postpaid \$1.85. C. O. D. 15c extra.

BENNER & COMPANY, T-74, TRENTON, N. J.

ST. CHARLES HOTEL
ATLANTIC CITY
Bathing direct from hotel
American and European Plan
RATES GREATLY REDUCED



Now Madison Offers for the first time a New Model Creation

Build this realistic scale model of the world's oldest and most famous lighter-than-air craft,—one of the most beautiful miniature models ever designed. Simple enough for anyone to build. The finished model is extremely desirable for decorative use.

Kit includes all parts to complete the ship and mast, with full size plan and instructions. (Length of ship 6 1/2"; height of mast 3"; colors: black and red; elevators and rudder: red, white and black. Send now for one or more of these kits. Great for gifts for young and old.

MADISON MODEL AIRPLANES
134 LIVINGSTON ST., BROOKLYN, N. Y.

KIT COMPLETE

25¢

POSTPAID

Dealers and Clubs:
Write for Special Discounts on this New Madison Creation.

The Aerodynamic Design of the Model Plane

(Continued from page 19)

The Action of the Dihedral Angle

It has been mentioned that the dihedral angle is the most efficient and practical method to use in order to secure lateral stability. This is because it will right the plane when tilted over sideways or "banked" without an appreciable tendency to "spin" it. Let us see how this result is obtained.

In fig. 81 is shown the wings of a plane, set at a large dihedral angle. The wings are in level or normal flight position. Now look at fig. 82. Here the ship has been tilted over into a "banked" position and slides downward sideways in the direction of arrow (M) because of the pull of gravity. This occurs for the same reason a car coasts down a hill. As in the case of the sweptback wing, under these conditions, the air strikes the air from the side as well as from the front. The arrows (F) indicate how this side draft strikes the dihedral wing on the lowest side. This action causes an increase in the lift on this wing.

On the other hand, the high wing spills out the air from under it as indicated by arrow (E) as well as receiving no impact or added lift from the side draft. In fact the air slides along it striking it at a decreased angle of attack. It is obvious therefore that the lift on this wing is reduced. The length of the arrow marked (1) show how the lift on one wing (the low wing) is increased and the lift on the high one decreased. This condition causes the plane to rotate back into the normal flight position, shown in fig. 81. In other words, the action is such as to cause the resultant lift (L) on the wing to move to the low side, thus in conjunction with the pull of gravity, producing a righting couple.

Whether or not the wing is dihedralized for the total span makes no difference. The center portion of the wing may be horizontal with dihedral only near the tips, and yet the action of the dihedral will be due to some basic reason given here. The only difference is that the air at the wing tips has a greater tendency to spill out and thereby reduce the wings' efficiency.

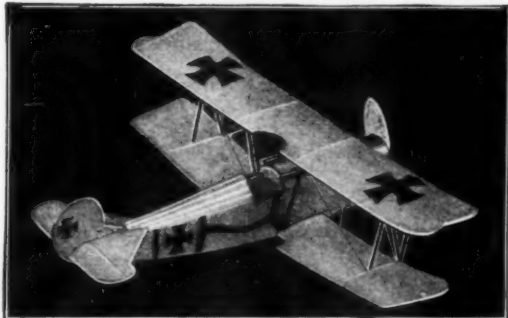
IT IS possible to turn up the wing tips to such a degree that to all effects and purposes, the tips are vertical fins. In fact vertical fin surfaces are sometimes placed at the wing tips, extending upward from the upper surface of the wing. These have an action similar to the dihedral. When the ship tilts over sideways the air approaching the plane from the side, strikes the fins above the wing causing a pressure on the fin sides which face toward the low side of the wing. This pressure is acting on a line passing above the center of gravity and thus causing a righting moment, pushing the low wing up and the high wing down.

The value of these vertical fins is that they have the effect of a dihedral and at the same time increase the lift on the wing. The lift and the efficiency of the wing increase because the fin reduces end spill when they are vertical and considered as fins, not

(Continued on page 44)

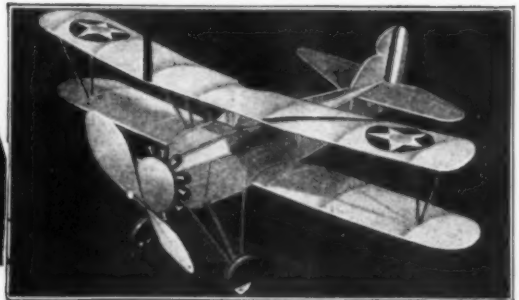
Build these Famous BPA Models

BUY KITS NOW BEFORE PRICES RISE!

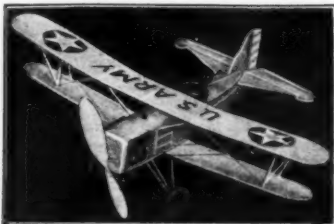


FOKKER D-7 FLYING SCALE
Here's a humdinger! A beauty to look at—a thrill to fly! **35¢ post paid**

35¢
EACH
POSTPAID
3 for \$1



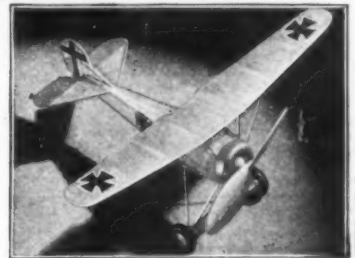
CURTISS HELL-DIVER
A marvel for realism! Notice the many professional details **35¢ post paid**



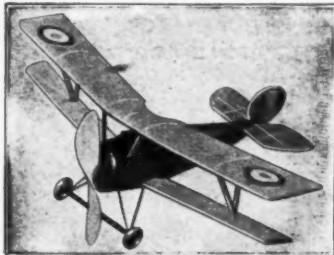
CURTISS FALCON FLYING SCALE
A wonderful biplane flyer **35¢ post paid**



R.O.G. STICK MODEL
A duration model, complete **25¢ plus 5¢ postage**



FOKKER D-8 FLYING SCALE
It's a whiz! **35¢ post paid**



NIEUPORT SCOUT FLYING SCALE
A war-time fighting plane **35¢ post paid**



GEE BEE SPORTSTER D
A speed plane with real class! **35¢ post paid**



HOWARD "IKE" FLYING SCALE
Here's a real knockout! **35¢ post paid**

HERE'S good advice! Now is the time to buy and build the famous BPA Models—before prices go shooting skyward! Make your choice from the marvelous line of kits shown on this page—each is a deluxe BPA Flying Scale Model Kit—each 12" to 15" wing span—the kind that the best model builders prefer! BPA stands for the highest quality of kits and supplies at the fairest, lowest prices. You get quick shipping service, and money back or exchange privileges if you are not satisfied!

Dealers!

Write on letterhead for special discounts. Big profits in handling BPA Supplies. You get real service and sales support.

CATALOG FREE

Send 3¢ stamp to cover mailing cost. You'll be surprised to see this beautiful Catalog which PICTURES our many wonderful supply items. Send stamp with your order NOW!



GENERAL CONTENTS OF KITS
Each kit contains FULL-SIZE 3-view plans. Kits are complete with banana oil, cement, formed wire parts, Balsa, Jap tissue, turned Balsa wheels, etc. In sturdy cardboard boxes. And remember these kits reach you post paid.

SEND NO MONEY — JUST MAIL COUPON!

Order kits the convenient C.O.D. way—send no money. Mark coupon "C.O.D." and pay postman on delivery. If you send cash, use Postal or Express Money Order. Canadians add 25¢ on orders up to \$1.50, 15% on orders over \$1.50. No Canadian coins or stamps accepted—use International Money Order. Print order clearly. Satisfaction guaranteed, exchanges made, or money refunded.



BALSA PRODUCTS CO. OF AMERICA

BALSA PRODUCTS CO. OF AMERICA
4150 W. Roosevelt Road, Div. 3-12, Chicago, Ill.

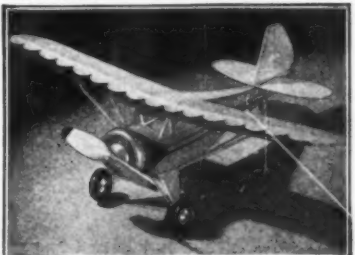
- () Send C.O.D. kits listed below. I will pay postman for kits, plus C.O.D. fee. No C.O.D. orders accepted for less than 2 kits.
() I enclose \$_____ for kits listed below.

NAME _____

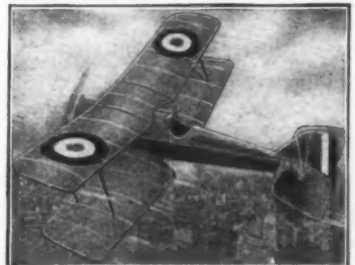
Street _____

City _____

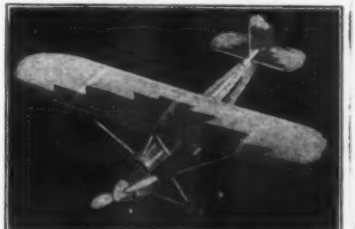
State _____



MONOCOUPÉ FLYING SCALE
Isn't she a peach? **35¢ post paid**



S.E.S. SCOUT FLYING SCALE
A biplane that's a pip! **35¢ post paid**



HEATH PARASOL FLYING SCALE
A marvelous flyer! **35¢ post paid**

The Welcome Xmas Gift! . . .

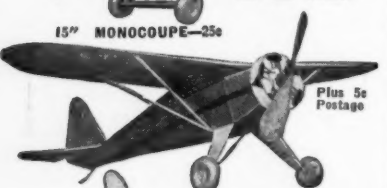
STARFLYERS

Guaranteed To Fly!
15" WingspanBeginners and more experienced model
builders will enjoy building and flying
these realistic models. Each kit com-
plete with semi-finished parts, printed
balsa, plans, etc.
2 OR MORE POSTPAID No. C.O.D.
KITS SENT

25c

Plus 5c
Postage

15" BELLANCA, 25c plus postage

15" FOKKER D7
25c plus postage

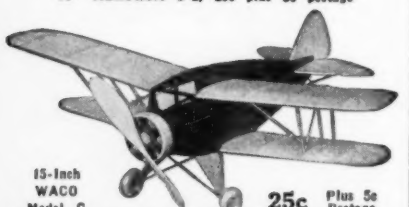
15" MONOCOUPÉ—25c

Plus 5c
Postage

15" PUSS MOTH, 25c plus 5c postage



15" AERONCA C-2, 25c plus 5c postage

15-Inch
WACO
Model C25c Plus 5c
Postage

| SUPERIOR QUALITY SUPPLIES | | | |
|---------------------------|------------------|-------------------|-------------|
| 15" Balsa Strips | Para Rubber | 3/16 | 2c |
| 1/16 x 1/16 3/4c | per ft. | 1/4 | 10c |
| 1/16 x 1/8 1c | 1/16" Sq. 1c | 1/2 | 20c |
| 3/8 x 1/8 1c | 1/16" Sq. 1c | 1 | 40c |
| 3/8 x 1/4 1c | 1/8" Sq. 1c | 2 | 80c |
| 3/16 x 1/4 2c | 3/16" Sq. 1 1/2c | 4 | 1.60 |
| 3/4 x 1/4 3c | Banana Oil | 1/2 oz. | 5c |
| Sheet Balsa | 1 oz. | 10c | |
| 1/32 x 2 2c | 1 oz. | 10c | |
| 1/32 x 3 3c | 2 oz. | 20c | |
| 1/16 x 2 4c | Cement | 1/2 oz. | 5c |
| 3/32 x 2 2c | 1 oz. | 10c | |
| 3/8 x 2 5c | 2 oz. | 20c | |
| 3/4 x 2 7c | Pinhole Washers | White or colored. | |
| 15" Plank Balsa | 2 Sheets 5c | Alum. Tubing | 6" Lengths |
| 1" x 2" 22c | 1/16" Lengths | 1/8 | 7c |
| 1" x 3" 30c | 1/8 | 7c | |
| 1" x 6" 37c | 2 Sheets 5c | Sheet Alum. | 12" Lengths |
| 2" x 2" 27c | Alum. Tubing | 1/16" Lengths | 15c |
| 2" x 3" 37c | 1/16" Lengths | 1/8 | 15c |
| 2" x 6" 70c | 1/8 | 15c | |
| Wood Veneer | 1/16" Lengths | 1/8 | 15c |
| Paper | 1/8 | 15c | |
| 2 Sheets 25c | 1/8 | 15c | |

★ STAR MODEL AERO SHOP ★
12 Pearl Street Newark, N. J.
Affiliated with Scientific Model Airplane Co.

The Development of the
Fokker Fighters

(Continued from page 11)

the front main spar was of constant dimension, while the rear spar gradually became thinner toward the wing tip to provide the necessary bending movement for wing warp lateral control. Wood faired steel tubing was used for strut material.

The sixth rib from the center in each bay of the upper wing was an especially strong compression member to which internal bracing wires fastened and to which were welded the interplane strut fittings. As in the M-7 these steel fittings were carried through the upper wing surface to serve as anchorage terminals for upper surface cabane fittings.

These two cabanes, one for each wing panel were covered to act in the capacity of anti-skid vanes. The overhang of the upper wing tip made upper surface bracing necessary as was true of the M-7.

AS in previous biplane Fokker designs, the upper plane was constructed of two panels connected to a series of inverted "V" shaped tubes the bases of which were welded to the upper longerons. Two were placed about the front cockpit, one in front and one behind, both being parallel but slightly inclined forward. The third "V" had its apex welded to the apex of the first series of struts and was decidedly inclined to the rear. The base joints of this inclined member were welded to the upper engine plate. A motor of Gnome make, furnished 80 H.P.

Consequently the M-10 Einstlg must have been a slow flyer by virtue of its large size and light weight. By comparing the size of the aeroplane with the man in the picture it can be seen that there was considerable aeroplane for a motor of that horsepower to pull through the air.

The Fokker monoplane show here will prove interesting to the student of aeronautical engineering as well as make a valuable addition to photo collections. It is the plane with which Anthony Fokker gave looping and stunting exhibitions shortly before the World War.

In design, this plane seems to be a modification of the old M-8, the wing having been set lower and more rigidly braced. Most interesting is the extremely tall cabane, or wire terminal built on the fuselage. By comparing this component with the same part of the M-8, one will see how Fokker maintained strength. The German inscription on the top of the photograph reads: "The new Fokker monoplane for inverted flight." To take care of additional strain, weight adding bracing was built into the structure of the wings and fuselage, necessitating a more powerful motor, in this case a Le Rhone of 110 h.p. With this plane, Fokker toured the counter around Germany giving "breathtaking" exhibitions of steep banks and turns, loops and slips, so common today.

NEXT in this series brings us one of those planes that, when just mentioned as having actually been built, brings a volley of denials from all quarters. Since the introduction of this series, it has been necessary for many "deniers" to admit that there were two-seated Fokker planes built

during the War. At the same time, a Fokker bomber "never was", these denials having been made from written sources of information, however, it is rarely that a photograph will not convince a person.

As can be seen from the photograph here, the Fokker bomber, named the K.1 by the factory classification systems, was quite a formidable affair for its day. Two Gnome motors, of not over a total of 300 h.p., were mounted in tandem in a center nacelle, one pushing and one driving a tractor propeller. A fuselage on either side of this center structure carried the tail assembly on its extremities, Caproni fashion.

A gunner-observer was seated in the nose of each fuselage, giving him an unusually fine arc of fire. The pilot was sandwiched in between the two motors, the rear power plant protecting him to some extent from a rear attack. There were no guns pointing aft, the wings evidently were thought to have provided enough hiding place for the gunners.

In profile section, the fuselages formed a good streamline. Four longerons and the usual upright members, wire braced, formed the structure. All during his series of designs, Fokker favored simplicity of construction to aerodynamic efficiency, and in the K.1 left the sides flat and unfaired.

Aluminum was carefully riveted to the fore part and each fuselage to a point just aft of the leading edge of the lower wing. The engine nacelle was entirely aluminum-covered. A conventional cowl and side fairing was used on the front motor, but in order to obtain the correct cooling, the rear motor was left uncovered. The oil and gasoline thus thrown against the tail planes and fuselages must have been quite hard on the coverings, to say nothing of the mechanics who serviced the plane.

This same feature must have made the plane a great fire hazard, as well as being aerodynamically unsound. In order to overcome this disadvantage, all exposed parts were carefully streamlined. A very modern type of landing gear showed that Fokker was considerably in advance of his time. Only two wheels were used, being connected by a spreader bar. Since the tread was quite small for the large wing span, wing tip skids were used to offset the possibility of damaging a wing on landing or taking off.

THE cellule structure had many interesting features, some of them quite out of the ordinary in the run of large types. Both planes were of equal span and chord and were divided into three sections, a large center section with the two fuselages as its outer limits, and a right and a left wing panel. The center section was fastened directly to the engine nacelle and to struts running from the fuselages to fittings in the upper wing. Two pairs of streamlined steel tubing struts were allotted to each wing bay with the usual number of landing and flying wires. From a front elevation the struts slanted outward toward the tips from top to bottom. Even on a large machine as this, wing warping was still used for lateral control.

By narrowing the chord of the lower wing between engine nacelle and each fuselage, the pilot's view was greatly improved. In general, this machine afforded the crew

(Continued on page 42)

ZIP NATIONAL MODEL CONTEST

Free 6000 MILE AIRPLANE TRIP
OVER THE COAST-TO-COAST ROUTE OF TWA "THE LINDBERGH LINE"
to the winner



10 Grand Prizes

*Build the New Douglas DC-1
with a complete ZIP SET*



Big Values ZIP JUNIOR CONTEST SET \$1.50

Here's what you get in the ZIP JUNIOR CONTEST SET. One each of the following ZIP tools—Utility Knife, Balsa Shaper, Sand Block, Balsa Stripper, Lacquer Brush, Sand Paper Pack, and balsa wood, plans, wheels and metal props, silver dope and cement for 14 1/2" solid scale model of Douglass DC-1. All packed in attractive carrying case decorated with real labels from the big airlines.

ZIP SENIOR CONTEST SET \$2.50

Large well made carrying case containing same items as above excepting addition of well made latest type dope and lacquer spray gun with glass jar, all aluminum ZIP Balsa Stripper, large tube of ZIP cement, extra set of labels of leading airlines for use on your luggage or room.

AERO MODEL BUILDERS' GUILD
HEMPSTEAD, LONG ISLAND, N. Y.

Here's your chance to enter one of the most exciting model contests ever arranged. Read the list of truly wonderful prizes and see if you agree. But that's not the half of it. Think of the kick you'll get building a model of the newest, fastest and most luxurious airliner ever to take the air. New York to Los Angeles in fourteen hours with fourteen passengers and two pilots—some ship! See page nine this issue for the entire story about this history making plane.

Now read the full details about the new ZIP Tool and Construction Sets. You will quickly note just how advanced they are. For in addition to complete materials to build a finished model you will be proud to own, they contain a full set of the famous ZIP model building tools. Each tool has been especially designed to make model building more exact and interesting. Both the ZIP JUNIOR AND ZIP SENIOR sets are great values in themselves. The contest makes them supervalue.

And there is an official entry blank with the few simple contest rules in every Zip Set—or you may make your own exact facsimile of the official form, and enter the contest—but don't delay, start now!

See contest rules on page 36.

If your dealer can not supply you with Zip model building sets, order direct.

DEALERS

Thousands of these ZIP SETS are being sold. Get your share of this profitable business. Write us or your jobber today for prices.

PRIZE LIST

1st Prize—6000 mile air trip over the T.W.A. system in one of the new DOUGLAS 200 M. P. H. airliners. Choice of eastward or westward route. Includes choice of stop over at DOUGLASS plant at Santa Monica, California, or visit to T.W.A.'s large base at Kansas City or a visit to New York City. Your meals and hotel bills included free.

2nd Prize—A 3000 mile air trip over the T.W.A. system in one of the new DOUGLAS 200 M. P. H. airliners. Choice of route optional.

3rd Prize—The TEXACO SILVER TROPHY CUP, presented by the Texas Co., which supplies all gasoline and oil to the vast T.W.A. air fleet.

4th to 10th Prizes—Full year's subscription to Universal Model Airplane News. "A course in aviation in every issue."

CONTEST JUDGES

Capt. Eddie Riechenbacher
C. S. (Casey) Jones
Commander Frank Hawks
T. Park Hay (T. W. A.)
Chas. H. Grant, Editor, Model Airplane News

Last date for Contest Entries—February 28, 1934
If your dealer doesn't carry ZIP sets—Use this coupon to order direct.

AERO MODEL BUILDERS' GUILD
244 North Franklin Street
Hempstead, Long Island, N. Y.

Gentlemen:

Enclosed find \$_____ (cash in registered letter or money order). Please send me Zip Contest Model Building Tool and Construction Set for a Douglas DC-1 airliner, as checked below:

_____ Zip Junior Contest Set @ \$1.50 each.

_____ Zip Senior Contest Set @ \$2.50 each.

Also enclosed: 15 cents postage for each set ordered.

Name _____

Address _____

City _____

State _____

"Skyhooks"—Past and Present (Continued from page 8)

Filled with confidence, Maloney was now ready to carry out another of his instructions. Holding his breath, the pilot manipulated his controls and held on for all he was worth. The machine began an amazing maneuver which required all of Maloney's great strength to keep his seat as it began to turn over on its side and continue on until it was once more in an upright position. The papers and scientific journals of the day described the maneuver as a "side somersault." Today we would call it a barrel-roll. Then came an amazing number of spirals and figure-eights before the craft landed safely in a predetermined field.

These flights continued and at one time the Professor had sixteen students in his flight school. During one of the launchings, however, the glider was damaged and Montgomery shouted to Maloney to parachute his balloon down. This he did accompanied by loud shouts of "fakir" from the crowd. On the succeeding attempt, the glider was again fouled and the Professor warned his pilot not to use the machine. However, Maloney did not take kindly to the crowd's disparaging remarks and he released his machine as he had done many times before. As he nosed it down to gather flying speed, a loud cracking noise reached his ears. Those on the ground merely saw the glider disintegrate as it picked up speed during its 4,000 foot fall.

Professor Montgomery gave up his aerial efforts for some time following this disaster but he was unable to remain away for long. Again he took up gliding but in 1911 he failed to survive a glider crash in San Francisco. However, his work first with models and later with gliders was a forerunner of hooking-on as practised by the Navy today.

SO MUCH for the past. What of the future? The mission of the naval airship will be that of a long distance scout. Its planes will not only assist in its defense against the enemy, but they will enable the airship to scout over a much greater area. The airship will fly on a straight course and, naturally, visibility is obtained for great distances on either side of her. This scouting range, however, will be greatly increased by dispatching a plane outward on either beam. These craft may fly out as far as one hundred miles or even further, thus providing a scouting front of more than two hundred miles in width.

An interesting phase in connection with these operations is that the airplanes never take off with the airship. Instead they go aboard only after the ship has taken the air. The reason for this is that on long voyages the airship cannot take off with the excess load of the planes, but once in the air she can carry a greatly increased load.

Airships obtain lift by two methods. Obviously, they possess the static lift provided by the gases carried within the huge gas cells. Secondly, they possess the ability to obtain dynamic lift exactly as the airplane does. By inclining the hull of the airship upward from the line of flight and

YOU Can't Expect a Model Airplane To Perform on a Magazine Page..BUT

Why Not Secure One Of These Fine Kits Now, and Convince Yourself That SCIENTIFIC KITS SATISFY

Every Kit Contains:

2 sheets colored tissue
Bottle banana oil
Tube cement
Washers
Rubber motor
All balsa strips cut to size
Full size plans and explicit instructions.

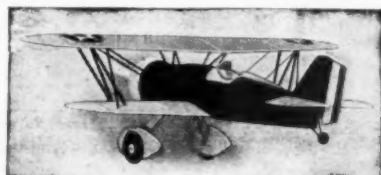
20" WINGSPAN

GUARANTEED TO FLY!

50c
PLUS
10c
POSTAGE



NIEUPORT "SCOUT" 20" 50c Plus Postage



CURTISS "GOSHAWK" 20" 50c Plus Postage



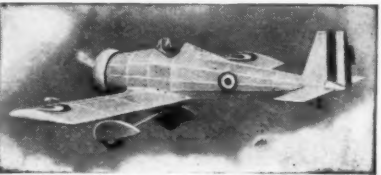
STINSON "RELIANT" 20" 50c Plus Postage



BELLANCA "Pacemaker" 20" 50c Plus Postage



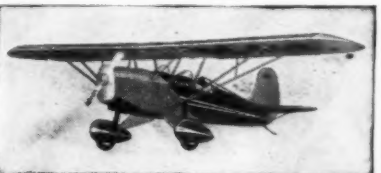
VANCE "Flying Wing" 20" 50c Plus Postage



VICKERS "JOCKEY" 20" 50c Plus Postage



WACO MODEL "A" 20" 50c Plus Postage



FAIRCHILD "22"-20" 50c Plus Postage

EVER-SO-EASY 10" Solid Scale Models

50c
POSTPAID

Every one a true replica. Kits come complete with full-size drawings and instructions; 5 bottles new ever-gloss featherweight dope and cement; sandpaper, split bamboo; pins; wheels; propellers; wing, tail-surfaces and other parts clearly printed on balsa; balsa blocks for fuselage and cowlings; and required insignia.



10" BOEING PURSUIT XP936



10" WEDELL WILLIAMS RACER 92



10" CURTISS AKRON FIGHTER



10" MONOCOUPÉ 110



10" PITCAIRN SPORT AUTOGIRO



BERLINER JOYCE FIGHTER XF12

Scientific Model Airplane Co.

277 HALSEY ST., Newark, N. J. Dept. N-12
DEALERS: Write for Special Discounts

READY TO FLY
Assembled in 2 minutes.
Complete, Postpaid **25c**

PERFORMANCE IN THE AIR IS PROOF

NEW! 6 FT. MONOCOUCPE



WINGSPAN 72" - LENGTH 43" - WEIGHT 12 OZ. - COLORS: YELLOW & BLACK

GUARANTEED TO FLY 500 FT.

COMPLETE KIT

\$5.00

SHIPPING CHARGES COLLECT

Contents of Kit:

Finished drilled propeller.
Finished drilled balsa wheels with brass bushings.
Finished drilled nose plug with brass bushing.
Finished drilled balsa cowling.
Finished drilled balsa cowl front.

Finished wire fittings.
Semi-finished balsa pants.
Tissue, rubber motor.
All balsa strips cut to size.
Large bottle banana oil, cement, and light-weight colored dope.
Full size plans and explicit instructions.

Capt. Hawk's Sky Chief "NORTHROP GAMMA"



Easy to build—Flies Great! 22" tapered wing, length 16 1/2", weight 1 oz. Complete, including finished cowl-ing, wheels, and semi-finished prop. Full-size plans and instructions. A swell holiday gift for any boy.

\$1.00

Postpaid

GEE-BEE SUPER-SPORTSTER



Complete \$1.50

Postpaid

Don't put off buying your holiday gift. NOW, while you are reading this ad, is the best time to send your order for Scientific kits... The Gift that's bound to satisfy.

Send for Catalog of Scientific High Quality Supplies or Ask for them at your dealer.

STINSON 26 1/2" TRIMOTOR AIRLINER



A real model of a real ship... one that should be in every model builder's collection. **\$2.00**
Why not buy one for Xmas? Postpaid



2 ft. GEE BEE SPORTSTER \$1.00
Complete and a winner! Postpaid



2 ft. MONOCOUCPE \$1.00
What a Flier! What a Gift! Postpaid

Scientific Model Airplane Co.

277 HALSEY ST., Newark, N. J. Dept. N-12

driving her ahead with her engines, she will support many thousands of pounds that she could not carry if the ship were not in motion through the air. In other words, the airship can also take advantage of an angle of attack and so gain lift. Because of this fact, the airship takes off the ground with only a quantity of fuel, ballast, and pay load. After taking flight, the airplanes go aboard and are carried dynamically. Of course, as fuel is burned, the weight may eventually become equalized.

The term "flying heavy" means that the airship is carrying part of her load dynamically. It is apparent that if all engines could stop, the airship would have to throw ballast overboard until the static lift could carry the load. If the ballast was in the form of fuel, the range of the ship would be cut down in proportion to the amount thrown overboard. Subject to the conditions discussed in this paragraph, the airship can hover over a given spot. If lost in a fog they could stop until better weather conditions prevailed. Best of all, since it does not depend upon any method of lateral control, the airship is not subject to the unstable conditions experienced by the airplane pilot when he is forced to fly blind.

BY FLYING an airship "light" is meant that the ship has too much static lift to permit normal flying at the desired altitude. One method of overcoming this condition would be to destroy lift by valving lifting gas. However, if helium is being used this becomes a very expensive procedure. To a certain extent "lightness" can be overcome by giving the airship a negative angle of attack. In other words, by inclining the bow downward and driving it down with the engines. By varying the negative angle of attack the ship thus can be held at the desired altitude.

A condition of lightness is most often brought about by the consumption of fuel. With decreased load the ship obviously becomes light. The water recovery gear of the U. S. Navy airships makes it possible to condense the engine exhaust gases and so maintain the original load. Thus the need for valving gas is eliminated.

When commercial airships have been constructed and placed on regular passenger and freight schedules the hooking-on of airplanes will be a routine matter and an important one. It requires an expensive terminal and a large crew to land the airship of modern dimensions. Few companies can afford to maintain many such stations. However, if these lines are to provide the service demanded by the public they must be prepared to accept passengers and freight at many points along the route of the aerial giants. It is here that the hooking-on plane will play its part. The cost of several of these planes will be relatively small and they can work out of any established airport.

Imagine the bustle in the waiting room about thirty minutes before one of the gigantic airships enroute to South America is due over the airport on the outskirts of Havana. The Station Master announces that contact plane Number Six is about to

(Continued on page 42)

FREE PLANS

FOR MODEL OF THE SPARROW HAWK

Add this flying model to your air fleet. Makers of Duco Cement offer free instructions on building this model of a plane used by the United States Navy.

Plan details tell how to make it stronger and more durable with Duco Cement. This unusual adhesive might have been made especially for model builders. It's transparent, waterproof, quick-drying and STRONG. 25c a tube at drug, stationery and hardware stores. For building instructions on the Sparrow Hawk and for valuable Duco Cement folder, send postal to DU PONT, Dept. U-12, Wilmington, Delaware.



IT'S TRANSPARENT


DOCO
household
adhesive
MAKING
REPAIRING
MENDING
DOES THE WORK OF
A DOZEN
PLASTER
PAINT
VARNISH
GLUE
Etc.

TUBE 1-5 ACTUAL SIZE

MOULDS TO CAST LEAD SOLDIERS OF ALL NATIONS

Indians, Farm and Wild Animals, Warship and Anker moulds. Model Railroad wheels. 244 different kinds. Every Mould Guaranteed to cast perfect figures. Combine Profit with fun. Fascinating. Mail 25c for sample castings. Send 5c stamp for big Illustrated Catalogue.

SCHIERCKE MFG. CO., Ghent, N. Y.



BUILD HUB MODELS
for Accuracy, Completeness, Performance

24" Models
All parts including bulkheads, ribs, etc. All clearly stamped on highest quality balsa; wire parts ready formed.

Your Choice

125
EACH POSTPAID

These kits come complete with full-size plans and instructions, everything to complete the models.

24" Boeing P12E \$1.25 P.D.

24" Curtiss A12 \$1.25 P.D.

24" U. S. Marine Falcon \$1.25 P.P.

18" Hub Speedster
Cabin plane. All parts stamped. A well flyer complete in every detail.

50¢
Plus 10¢ Postage

Remit by money order. Send 3c stamp for detailed price list.

HUB MODEL AIRPLANE & SUPPLY CO.
475 Brook Ave., Bronx, N. Y. (Dept. N-12)



The Development Of The Fokker Fighters

(Continued from page 38)

excellent visibility in all directions.

The K.1 Fokker is impressive for several reasons. First, it is the one and only bombing plane or "Grossflugzeug" made by this genius during the War. The seating arrangements and general design are noteworthy although this machine did not live to see actual service in numbers.

By comparing the size of the motors with the rest of the ship it can be seen that the K.1 was hardly in the size class with the Gotha and Friedrichshafen of the same category. Since the total power available could not have exceeded 300 horsepower, the static thrust for this type was then very low, probably not more than 1500 pounds. Therefore, for a plane of its size and purpose the speed and climb must have been far below standard, and the useful load too small to be effective.

However, aerial bombardment like aerial combat in 1915 was a new and untried science. Had this plane been accepted by the Germany Army, it would have been classed as the Fokker G.1.

THE closeup photograph of a Fokker biplane fuselage shown here is interesting for details of construction and design. It shows clearly the method of coving in the motor, the placement of the radiator and the shape of the propeller. The steel tubing landing gear shows up to advantage and clearly demonstrates the method of construction.

Just beneath the propeller shaft a Maltese cross has been painted on the cowling to show that the plane belongs to the German Imperial Air Force. It was a custom among the pilots later on in the war to paint such a cross in the same place on a plane that had been used for bringing down an Allied aircraft.

Installment five of this series will bring pictures and details of the Fokker Eindeckers, including a photograph of the plane in which Immelman lost his life.

"Skyhooks" Past and Present

(Continued from page 41)

take off. Passengers hurry to the ramp where they board the cabin plane.

The passengers take their place in the cabin and after all are seated the pilot taxis to the end of the runway. Opening his throttle wide the aviator lifts his craft into the air and heads out to sea to intercept the mother ship.

As the first plane clears the ramp, two others of similar appearance taxi up and are loaded full with freight destined for delivery to various countries in South America. They, too, in turn take off and follow the passenger plane out over the clear tropical waters.

THERE in the distance, but appearing quite close because of her size, is the airship sailing along at seventy-five miles an hour. Her trapeze gear is hanging downward awaiting the arrival of the Havana passengers and freight. The radio has already informed the purser of the number of passengers and the Captain has made ar-

rangements in the freight compartment for the stowing of the load which is to come aboard.

As the planes near the airship, a signal flag informs them that the ship is ready to take them aboard. Flying close to the monster the passenger ship slips in under the enormous body and with scarcely a jar he locks his craft onto the bar. Immediately, the plane is hoisted into the airship's hangar and a ladder is passed over to the cabin door. The passengers disembark and are taken in hand by the steward. The passengers from New York for Havana now take their places in the cabin plane which is then lowered. The pilot turns up his engine and releases the plane which glides down to the airport.

Its place is taken by the first freight plane which is taken aboard quickly and its freight removed into the ship. Similarly, freight for Havana is stowed in this plane and he is lowered away for the return trip to the Cuban airport. Likewise, the second freight plane discharges its load and returns to its base. This process is continued as long as necessary.

In this way, passengers who left New York only the night before reach their destination in the shortest possible time, and their trip has been the most comfortable possible. They have flown high enough to keep cool, they have enjoyed a good night's sleep, and they have had delightful meals. Another advantage of the airship for long distance travel is the fact that, to those on board, the engines are comparatively quiet. Beyond a doubt, airship travel in its perfected form will be unexcelled by any other types of transportation.

Plans are already under way for the establishment of air liners described above. In the not too distant future we shall see them plying the aerial trade routes of the world. The work of the United States Navy along these lines is but the beginning of tremendous commercial application of airships in combination with the airplane.

The World's Greatest Airliner

(Continued from page 9)

wing were tested in order to select the best variation. The nacelles and engine cowling were investigated in great detail and a final solution reached, which decreased the over-all drag of the engine installation to one-half of its original value and also caused a minimum of disturbance of the aerodynamic characteristics of the wing by the nacelles.

The tail surfaces were tested with elevator free and with it fixed, this being probably the first time that an elevator free investigation had been carried out on a complete airplane model. The effect of control surface tabs was investigated, both on the elevator and on the rudder. Several types of aileron and six variations of high lift device were investigated on the model. The design was guided by the wind-tunnel test and changes suggested by the tests were incorporated in the model and retested until a final maximum was obtained.

In all, the wind-tunnel investigation ran to 200 tests and covered a period of three months. A paper presenting an abstract

of the most important of these tests was given before a joint meeting of the S.A.E. and the A.S.M.E. by Dr. A. L. Klein of the California Institute of Technology Laboratory on July 1, 1933, and will be published shortly in the Journal of the S.A.E. As a result of these tests, the cruising and maximum speeds have been increased nearly 25 m.p.h., and the landing speeds have been decreased 5 m.p.h., giving a total increase in speed range of 30 m.p.h.

HIGH lift devices have been so chosen and located that with these devices in use the airplane may be flown under complete control with the normal type control surfaces. Stability has been adjusted to provide the desired amount for cruising flight, with a likewise desired lower degree near the stall, thus making the airplane easily handled in the cruising attitude and easily controlled near the stall. These various developments enable the airplane to carry pay loads common to larger crafts at speeds and with a degree of control common to smaller, high performance airplanes.

Responsibility for the design of the "Airliner" includes H. H. Wetzel, Vice President; J. H. Kindelberger, Chief Engineer; A. E. Raymond, Asst. Chief Engineer; and F. W. Herman, Project Engineer—all of the Douglas Company, who have worked in close collaboration with the T. W. A. management.

Regarding the structural details, it is interesting to note that the entire structure has been constructed of the new 24S alloy developed by the Aluminum Company of America. The particular material used is largely 24SRT Alclad. The strength of this material, particularly the yield point, is appreciably greater than the alloys formerly in use. The wing is of cellular, multiweb construction. It is 85 ft. in span and is tapered in plan form and thickness. The center portion of the wing is integral with the fuselage and serves as a mount for the nacelles and retractable landing gear is operated by a single hydraulic mechanism, thus avoiding complications incident to electrical drive.

Retraction is accomplished in 25 seconds and lowering in 20 seconds, by means of a pump which may be operated by either pilot or co-pilot. The landing gear is counter balanced. Hydraulic brakes are used which may be applied by either the pilot or co-pilot with a differential control operating through the rudder pedals. The chassis wheels retract upward and forward into the nacelles. In the retracted position, the axles rest in sockets attached to a main nacelle bulkhead, and, in the event of emergency, the plane may be safely landed on its wheels in the retracted position with no damage except to the propeller tips. Since the wheels in retracted position are several feet ahead of the C. of G. of the airplane, there is no tendency to nose over during such a landing. This has been demonstrated by an actual test. The brakes are also operable with the wheels retracted.

THE engine nacelles are monocoque except for the engine mount itself, which is welded steel tubing. The engine mount (Continued on page 46)

WE PAY POSTAGE!!

ON ANY ORDER
IN THE UNITED STATES
AMOUNTING TO 50c OR OVER

NOTE: All Balsa listed in 36" lengths may also be had in 18" lengths, if requested.

BALSA

Majestic balsa is cut of genuine, clear, straight grained stock. It is the strongest and lightest balsa, and guaranteed to be free from any defects.

36" Lengths

| | |
|-------------|-----|
| 1/16 x 1/16 | .01 |
| 1/16 x 1/8 | .02 |
| 1/16 x 1/4 | .03 |
| 1/8 x 1/8 | .03 |
| 1/8 x 3/16 | .03 |
| 1/8 x 1/4 | .04 |
| 3/16 x 3/16 | .05 |
| 3/16 x 1/4 | .05 |
| 1/4 x 1/4 | .06 |
| 1/4 x 3/8 | .07 |
| 1/4 x 1/2 | .08 |
| 3/8 x 3/8 | .12 |
| 1/2 x 1/2 | .19 |

40" Lengths

| | |
|------------|-----|
| 1/8 x 3/8 | .04 |
| 1/8 x 1/2 | .06 |
| 3/16 x 3/8 | .06 |
| 3/16 x 1/2 | .08 |

Sheets—36" Lengths

| | |
|----------|-----|
| 1/32 x 1 | .04 |
| 1/32 x 2 | .07 |
| 1/16 x 1 | .06 |
| 1/16 x 2 | .09 |
| 1/8 x 1 | .07 |
| 1/8 x 2 | .10 |
| 3/16 x 1 | .08 |
| 3/16 x 2 | .12 |
| 1/4 x 1 | .10 |
| 1/4 x 2 | .15 |
| 1/2 x 1 | .17 |
| 1/2 x 2 | .22 |

Plank Balsa

| | |
|------------|------|
| 1 x 1 x 36 | .25 |
| 1 x 2 x 36 | .45 |
| 1 x 3 x 36 | .60 |
| 1 x 6 x 36 | .75 |
| 2 x 2 x 36 | .55 |
| 2 x 3 x 36 | .75 |
| 2 x 6 x 36 | 1.40 |

Propeller Blocks

| | |
|---------------|---------|
| 3/4 x 1/2 x 5 | .02 |
| 3/4 x 3/4 x 6 | .02 1/2 |

| | |
|------------------|---------|
| 1 1/2 x 3/4 x 6 | .03 |
| 1 1/2 x 3/4 x 7 | .03 |
| 3/4 x 1 x 7 | .03 1/2 |
| 3/4 x 1 x 8 | .04 |
| 3/4 x 1 1/4 x 10 | .07 |
| 3/4 x 1 1/4 x 10 | .06 |
| 3/4 x 1 1/4 x 11 | .07 |
| 3/4 x 1 1/4 x 11 | .08 |
| 3/4 x 1 1/4 x 12 | .08 |
| 3/4 x 1 1/4 x 12 | .10 |
| 1 x 1 1/4 x 13 | .14 |
| 1 x 1 1/4 x 14 | .14 |
| 1 x 1 1/4 x 16 | .15 |

DOWELS

Genuine straight grained, birch dowels.

| | |
|-----------|---------|
| 1/8 x 36 | .02 |
| 3/16 x 36 | .03 1/2 |
| 1/4 x 36 | .04 1/2 |

BAMBOO

Genuine TONKIN knot bamboo. Strong, light, and splits easily.

| | |
|------------------|---------|
| 1/16 x 1/4 x 12" | .01 |
| 1/16 x 1/4 x 18" | .01 1/2 |

Shredded Bamboo

| | |
|-------------|---------|
| 1/64 x 1/64 | .04 dz. |
| 1/32 x 1/32 | .05 dz. |

JAPANESE TISSUE

A light, strong and high-grade material for covering models. Is excellent for doping.

| | |
|---------------|-----|
| White 20 x 24 | .03 |
|---------------|-----|

COLORADO TISSUE

A light high-grade material that comes in the following shades: Blue, Red, Brown and Orange.

20 x 24

| | |
|---------|-----|
| 20 x 24 | .05 |
|---------|-----|

EXTRA FINE TISSUE

An extra light tissue that is used on endurance models.

20 x 15

| | |
|---------|-----|
| 20 x 15 | .05 |
|---------|-----|

CELLULOID WHEELS

Sturdy, light, and very neat looking. Used for standing and flying scale models.

| | |
|---------------|------|
| With Bushings | Pair |
| 3/8" | .10 |
| 1/2" | .12 |

BUSHINGS

Used as hubs for wheels. 1 Doz.

| | |
|------|-----|
| 1/8" | .15 |
| 1/4" | .25 |

MUSIC WIRE

Strong, steel wire that comes in 1 ft. lengths. Sizes .014, .020, .028, .034.

DUMMY MOTORS

Very light, nine cylinder dummy radial engines. Adds a realistic touch to your plane.

| | |
|--------------|-----|
| 1 1/2" Diam. | .25 |
| 2" Diam. | .45 |

RUBBER

The very finest rubber used for model airplanes today. More turns and less weight.

| | |
|-----------|---------------|
| 1/32 Sq. | 2 ft. .01 |
| 1/16 Sq. | 1 ft. .01 |
| 1/8 Flat | 1 ft. .01 |
| 3/16 Flat | 1 ft. .01 1/2 |

ALUMINUM ITEMS

Tubing

| | |
|-----------|---------|
| 1/8 O.D. | ft. .15 |
| 3/16 O.D. | ft. .18 |
| 1/4 O.D. | ft. .20 |

Drag Rings

| | |
|--------|-----|
| 1" | .18 |
| 1 1/2" | .20 |
| 2" | .25 |
| 2 1/2" | .28 |
| 3" | .30 |

Sheet Aluminum

| | |
|----------|---------|
| 12" wide | ft. .15 |
| .003 | .20 |
| .005 | .20 |

N.A.C.A. Cowlings

| | |
|--------|-----|
| 1" | .18 |
| 1 1/2" | .20 |
| 2" | .25 |
| 2 1/2" | .28 |
| 3" | .30 |

Sheet Aluminum

| | |
|----------|---------|
| 12" wide | ft. .15 |
| .003 | .20 |
| .005 | .20 |

WASHERS

Suitable for all types of models.

| | |
|------------|------------------|
| Large Size | 3/4 O.D. .63-dz. |
| Small Size | 1/2 O.D. .63-dz. |

MAJESTIC CEMENT

The best cement being used in the construction of model airplanes. The quickest drying, strongest, colorless cement on the market.

| | |
|------------|-----|
| 1 oz. Tube | .10 |
| 2 oz. Tube | .20 |
| 4 oz. Tube | .35 |

CLEAR DOPE

The finest dope for doping your models.

| | |
|-------|-----|
| 1 oz. | .10 |
| 2 oz. | .20 |
| 4 oz. | .35 |

COLOR DOPE

Majestic colored dope is made of the highest quality ingredients and is made specially for model plane purposes.

Does the job you want it to do. Blue, orange, yellow, silver, black, and olive drab.

| | |
|-------|-----|
| 1 oz. | .10 |
| 2 oz. | .20 |
| 4 oz. | .35 |

ACETONE

Otherwise known as thinner.

| | |
|-------|-----|
| 2 oz. | .10 |
| 4 oz. | .20 |

THRUST BEARINGS

Strong, light and durable.

| | |
|-----------------|-----|
| Small .025 hole | .02 |
| Large .035 hole | .03 |

ALL ORDERS ARE SHIPPED 30 MINUTES
SPEED-- AFTER WE RECEIVE THEM.

Majestic Model Airplanes

Service — Quality — Speed

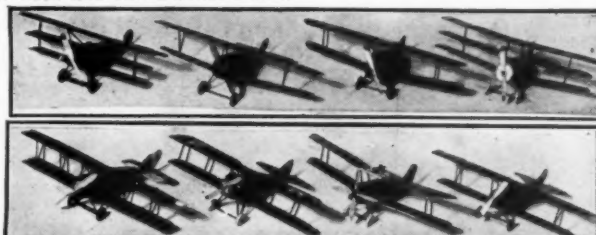
815 Broadway

Brooklyn, New York

RENEW YOUR SUBSCRIPTION TO UNIVERSAL MODEL AIRPLANE NEWS AND RECEIVE A GOLDEN WINGS PIN. SEE OUR OFFER ON PAGE 45 IN THIS ISSUE. SILVER WINGS PIN OFFERED WITH ALL NEW SUBSCRIPTIONS.

Nifty Wartime Solid Scale Model Kits

(7 INCH) Very realistic little jobs, complete with Cement, Insignias, several bottles of attractive Colored Dope, more than enough Balsa, Wheels and exact Scale Plans.



TOP ROW: Fokker Triplane, Nieuport, Sopwith Camel, Sopwith Triplane. BOTTOM ROW: Paine, Spad, S.E. 5A, Fokker D-VII. These Solid Scale Model Kits are practically the most complete kits on the market. Build the whole TROST Fleet! 15c Each—4 for 55c THE COMPLETE FLEET—\$1.05

THE ORIGINAL 22" HI-FLYER

Get this Kit today, of an attractive and amazing performing Model. This three colored Model will easily take off and sometime climb to height of 75 to 100 ft. After adjustments you can get distance flights from 500 to 1,000 feet. Kit contains full size layout sheets and instructions, balsa strips, turned nose plug with semi-finished nose, stamped ribs and formers, balsa prop.



block, 1 1/2" red cell, wheels, bamboo formed wire parts, rubber cement, banana liquid and red, white and black tissue. Ideal Christmas Gift.

Complete Kit, Postpaid 75c With hand carved prop ready for use, 10c extra.

TROST MODEL AIRPLANE & SUPPLY CO.
3111 W. 63rd STREET, Dept 40, CHICAGO, ILL.



NEW 20" Detailed Plans

Plane any Model Builder will enjoy working from, because all ribs, bulkheads and dimensions are clearly shown. Models built from these Plans are not only Perfectly Detailed but Perfect Performers.

Boeing P-26 Pursuit
Boeing P-12F Pursuit
Curtis Swift L.W. Pursuit
Sparrow Hawk
Vought Corsair
Monocoque
Texaco Sky Chief
S. F. A. D.

Your Choice, 2 for 25c, 4 for 45c, 6 for 65c. All Plans are sent Postpaid.

Send Cash or Money Order.

All Plans Sent Postpaid.

No Stamps or C.O.D.'s

3 Air Race Favorites by PIONEER ALL Flyers!

Our kit prices are NOT going up!



WORLD'S RECORD LAND PLANE
An authentic reproduction as only Pioneer can build it. Big 26" span model—wt. 2 oz. Complete kit with hand carved prop **\$2.35**



HOWARD AEROL TROPHY PLANE
Here's one of the "sweetest" flying models you ever flew. Snappy—speedy lines, big 20 1/2" wing span—wt. 3/4 oz. Complete kit, all stock to dimension, full-size plans—etc. **\$1.50**



HAWK, PRIDE OF THE PURSUIT!
Designed to stunt just like the real ship—will fly inverted. A neat, detailed model, 15" span—very easy to build, due to Pioneer's copyrighted method of building. Postpaid **\$1.10**

Model Flyer's Guide and Catalog **10c**

Postal Insurance 5c extra
PIONEER MODEL AIRPLANE SUPPLY CO.
CHAMPAIGN, ILLINOIS



JAPANESE MODEL AIRPLANE TISSUE

In 32 colors
Direct Mill Importers for the Trade.
WHITFIELD PAPER WORKS
12 VESTRY ST., New York City
Established 1869

"Reference from Penna.: 'Your samples of paper were received today, and I must say it is the finest selection of covering I ever saw, and I have seen many kinds.'
Ask for WHITFIELD'S!
It's the best! — Brilliant and Thin!

We Pay Shipping Charges

The Aerodynamic Design of the Model Plane

(Continued from page 36)

a part of the wing surface. If calculated as wing surface, the wings' calculated efficiency would be less, for vertical fin surface considered as wing surface would not contribute any life but merely pressure in a horizontal direction. Lift acts vertically.

The increase in wing efficiency in such cases is due to the fact that the lifting vacuum near the wing tips next to the fins is not reduced by air slipping into it around the tips from the undersides of the wing. When fins are used, the vacuum over the wing near the tips is more complete and greater lift and efficiency results.

Designers of large planes have hesitated to use sweptback and dihedral wings for several reasons. One of them which also effects model planes is the loss of a certain amount of efficiency, when either of these two stabilizing methods are used. It seems true without exception that whenever you design your ship for stability, you gain it invariably at the expense of efficiency of flight or loss of lift.

Consider the sweepback in the light of this idea. If wings were arranged with no sweepback, yet with the same area, it is apparent that they would have greater span, (distance from tip to tip). Consequently, a wider column of air would act on the wing and cause greater lift. Also the aspect ratio would be greater and you know from previous discussion that higher aspect ratios give greater efficiency. (More lift and less resistance or drag.)

In the same manner the dihedral wing loses a certain amount of efficiency. It is easy to understand that a portion of the air pressing up under the wing slips or is spilled out of the ends of the wing if they are slanted upward. The greater the degree of dihedral, the more air is spilled out from under the wing. It is the pressure of the air under the wing relative to the degree of vacuum above it that produces lift. Therefore, when this pressure is lessened by end spill, the lift is reduced. Obviously then, it is best to use as little sweepback or dihedral as possible and any other arrangement that can be used in conjunction with either of these systems is desirable. That is, provided this arrangement does not also materially reduce wing efficiency.

Low Center of Gravity with Sweepback or Dihedral

ONE arrangement that increases stability without loss of efficiency is the low center of gravity or weight. It is therefore advisable to use this factor in conjunction with sweepback or dihedral.

If the center of gravity is located so that it is one-twentieth the span below the wing center section, then about one-half the normal amount of sweepback or dihedral may be used. (See first part of chapter 3.) The reason for this may be more clearly understood if you will observe fig. 80. Here we have a plane with sweepback wings. The normal righting moment when the center of gravity is high, at (H), is (A) times (L). When the center of gravity is lowered to (D), it

can be seen that the righting moment is increased because the lever arm (A) has been increased to (A₁), yet (L) has the same value in either case.

In fig. 82 a dihedral wing is shown with the center of gravity lowered. Gravity in this case is represented by the arrow (P). When it was high, it was acting as indicated by arrow (G). It can be seen that in this case, as in the case of sweptback wings, the moment arm (A) is increased to (A₁) and that therefore the righting moment (A₁) times (L) is larger because of a low center of gravity.

Many readers will recall possibly that it has been considered good practice to raise the wing above the body, producing what is known as a "parasol" plane. By doing this, the builder has merely lowered the center of gravity relative to the center of lift of the wing. In this manner he has gained greater lateral stability without increasing the dihedral angle and losing wing efficiency.

Next month we will consider the problems of lateral oscillations which disturb the lateral stability of your planes. Until then, happy landings.

Air Ways—Here and There

(Continued from page 22)

following members won places:

Bamberger Duration Event:

John Romanowski, 2:38. 9 min.

Walter Skokna, 2:16. 9 min.

Alton DuFlon, whose model flew out of sight, 2:12 min.

Fuselage R.O.G. Event:

Henry Orzechowski, 1:56.5 min.

Emanuel Radoff, 1:24 min.

Richard Docen, 1:14 min.

Two new National records were established in the Glider Event. Fred Korn established a tow launched senior glider record with a flight of 1:16-2 min., and Stanley Congdon who won the Jack O'Meara Trophy at the First Annual Glider Contest July 1st, established a new junior record with 40.2 seconds. John Zeboyan placed third in this event with 33 seconds. All gliders except Congdon's had to be weighed to come up to the requirements of one ounce for every 50 square inches of wing area.

The American Legion Model Contest

The American Legion Model Contest held in Indianapolis, September 30th, and October 1st, was attended by boys from several states, one being sent from California by winning a meet there. The entry list contained about forty entrants. The indoor division of the meet was the scene of a number of interesting flights by some queer and unusual models. The new Arup flying wing type was well represented and flew remarkably well. Mr. Lawrence of Chicago, brought up a large ornithopter that flapped its way around like a huge, blind moth. One ship used two propellers on the nose, both going in opposite directions.

The meet was held in the Butler University Field House, with about eighty feet of altitude in the center. Drafts and lights combined however, to put any flight going over 65 feet in danger. This partly ac-

counted for the low durations achieved.

The winners were as follows:

| | Duration |
|--------------------|----------|
| 1. Russ Hofmeister | 9:59 |
| 2. Ira J. Hassad | 9:48 |
| 3. Vernon Boehle | 9:45 |
| 4. George Mackie | 7:45 |
| 5. James Neff | 7:30 |

(Continued on page 46)

"Shots" From The I.A.A.P.E.

(Continued from page 29)

just as royally as he treated the two visiting members.

The Club's "Three Musketeers" of the Northwest, Phillips, Attwood and Williams, all of Seattle, have just about shot-up everything around their locality and bemoan the fact that new "types" are almost as scarce as hair on a bald man's head. Williams expects to make a tour of the neighboring states in search of camera-fodder soon.

The first contest for the best Aircraft Photos in the International Amateur Aircraft Photo Exchange ended on September 23rd, 1933 as the three judges finally picked the winners. The winner of first prize was "Jim" Hawkins of Brooklyn, N. Y. Jim is one of the recently accepted members and the fact that he won the first honors shows that he must know his stuff. Justin Durrenberger who is also a Brooklyn lad, took the second honors. Seems like Brooklyn is producing a good crop of photographers this year. The third prize went to none other than "Chuck" Kossack of Chicago, who was barely nosed out by the other two winners. The three members who received honorable mention were Art Whitmer, Ollie Phillips and Ned Moore. The contest was quite hard to judge and the winners were quite a proposition to select. So let's all congratulate the boys who won mention.

The Bamberger Aero Club of Newark, N. J., was the sponsor of this contest and sure deserves the plaudits of all the members of the I.A.A.P.E., for the valuable assistance rendered. If it were not for this organization, the Bamberger Aero Club, we are sure that the contest would not have been the success that it was. Mr. Irwin Polk, the director of this group, was probably the most outstanding figure in the building up of the I.A.A.P.E. contest and deserves a medal of some sort in appreciation of his work.

MEMBERS are asked to submit a few photographs to our secretary, Mr. Ben Heinowitz, so that they may be presented to the Bamberger Aero Club as a gift for their Reference and Reading Room. The judges of this contest had quite a time of it and also deserve mention. There were three judges, Lieut. G. R. Johnson, famous aerial explorations photographer and also C. O. of the 119th Photo Section, 44th Div. Aviation, N.J.N.G.; Lieut. Richard Aldworth, manager of the Newark Metropolitan Airport, which was quite an honor for us; and Mr. John McLoughlin who is the aviation photographer for the New Jersey News Service. His position enables him to become a most excellent

(Continued on page 48)

KITS READY TO ASSEMBLE

BOYS! these kits are different. No tracing or cutting, we do that in the factory. You get your kit with all parts cut to size, notched and turned, ready to streamline and assemble.

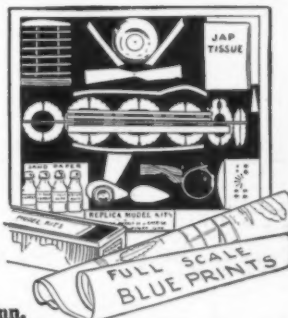
18 FLYING and 13 SOLID MODELS

Each made from the original factory design—You can save time and do a better job. **Flying Models:** All ribs and body formers are ready formed, cowls are furnished, parts are formed ready for cementing, propeller blocks are proper length and partially shaped, wheels are finished and parts requiring special cutting are formed to outside dimensions ready for streamlining. No cutting from sheet balsa on blocks necessary. Full scale Blueprints with each kit—there's no drawing for you to do. **Solid Models:** Shaped to outside dimensions ready for streamlining. Full scale Blueprints, colored paint, wire, wheels, etc., needed, furnished complete.

These Ships will FLY and how!

Hundreds of model makers write us how they like putting our ships together and how cleanly they fly. No divers in the Aircraft models line of ships. Look at the List of Models—Solid or Flying, they are made different than any you ever saw before. Get your Club interested today!

DO YOU WANT A COPY OF
LT. POWERS AERONAUTICAL
DICTIONARY?
SEND 10c FOR A COPY.



FLYING

| Name | Wing Span | Price |
|--------------------|-----------|--------|
| Fairchild 24 | 24" | \$1.50 |
| Percival Gull | 36" | 3.00 |
| Ship Board Fighter | 25" | 2.50 |
| Sky Rider | 21" | .75 |
| Sky Buggy | 21" | .75 |
| Wedell-Williams | 20" | 1.50 |
| Howard Ike | 22" | 2.00 |
| D. H. Moth | 21" | 2.00 |
| Fairy | 20" | 2.50 |
| Gee Bee | 20" | 1.50 |
| Lockheed Orion | 24" | 1.50 |
| Fokker D-7 | 21" | 1.50 |
| Consolidated Tr. | 20" | 1.50 |
| Curtiss Robin | 18" | 1.00 |
| Curtiss Coupe | 18" | .75 |
| Fokker Universal | 20" | 1.50 |
| Fuss Moth | 20" | 1.50 |
| Vought Corsair | 20" | 2.00 |
| Lockheed Vega | 30" | 2.50 |

SOLID

All 8" \$.75 All 12" \$1.25

Lockheed Sirius
Lockheed Vega
Hell Diver
Travelair Mystery
Fuss Moth
Wedell-Williams
Bellanca
Gee Bee
Shipboard Fighter
Boeing Fighter
Laird Solution
Lockheed Orion
Northrop Gamma

Send 10c for postage.
Orders promptly filled.
Get our Club Proposition.

Aircraft Models Co. of America, Hartford, Conn.

2 New Models—World Record Planes



Laird Super Solution

Exact scale model of J. Doolittle's Coast to Coast Record Breaker of 1931. 1/2" scale model. Length 10", Span 10-7/16". Complete kit includes Peerless Balsa, colored dope, insignia, plans and instructions. Postpaid only

75c



Ben Howard's "IKE"
Plans approved and signed by Ben O. Howard. 1/2" scale. Length 12", Span 15 1/2". Complete Kit. Post Paid

\$1.00



Vickers Super Marine S-6-B

Accurate model of World's Record plane that made 408.8 M.P.H. 1/2" scale. Length 14", Span 15 1/2". Complete kit includes everything—wood, colored dope, insignia, plans, instructions. Postpaid only

\$1.35



U. S. Army Boeing P-12 F
1/2" scale model. Span 22 1/2", Length 15". Complete kit, insignia, instructions, plans. Postpaid

\$1.75

WRITE FOR FREE PRICE AND PARTS LIST OF 20 OTHER KITS AND MATERIALS

Peerless Model Airplane Co.

15535 Madison Ave., Lakewood, Ohio

NRA Member

NO JOKING... MONEY SAVED IS MONEY EARNED

Wouldn't you like to earn 75c?

Twelve issues of UNIVERSAL MODEL AIRPLANE NEWS at the regular single copy sale cost amounts to \$2.40 . . . and by subscribing for \$1.65 a year you save yourself 75c.

Fill in the coupon below and mail it to us together with your money order or check for \$1.65 and we will enter your name to receive the next twelve issues of your favorite magazine. In addition we will mail you one of our famous SILVER WINGS PINS, emblematic of your honorary membership in our Aero Science Crusaders Club. It's a beautiful, richly-ornamented silver pin . . . one you're sure you'll be proud to wear.

If you are already a subscriber and your subscription expires with this issue . . . or were a former subscriber and failed to renew your subscription . . . use the coupon below to renew your subscription for another year. By doing so you will be entitled to one of our GOLDEN WING PINS. This pin is similar in design to the silver pin, but gold-plated instead of silver.

If you do not wish to cut the magazine make a coupon similar to ours on a sheet of paper.

JAY PUBLISHING CORP.,
125 West 45th St., Desk 100
New York City.

Enclosed find \$1.65 for which please send me UNIVERSAL MODEL AIRPLANE NEWS for one year. It is understood that I am to receive the pin that I am entitled to.

NAME _____
ADDRESS _____
CITY _____ STATE _____
NEW () RENEWAL ()
Check One

READY-BUILT SILVER FLASH MODELS



U. S. ARMY PURSUIT (18" wing span)
FULLY CONSTRUCTED—READY TO FLY
A real flying model of the Army's fastest pursuit ship, said to be capable of doing over 225 miles per hour. Complete as shown, Imm. 9 cyl. radial motor, speed ring, pants, tail wheel, Army insignia, etc. Only \$2.25 postpaid.



U. S. NAVY AKRON FIGHTER (18" wing span)
FULLY CONSTRUCTED—READY TO FLY
Finely detailed model of the U. S. Navy's Fighter, used in dirigible service. A fast, stable flier, takes off under own power. Complete \$2.50 postpaid.



U. S. ARMY FIGHTER (18" wing span)
FULLY CONSTRUCTED—READY TO FLY
Detailed as shown, Imm. radial 9 cyl. motor, drag ring, Pilot's cockpit, Army insignia, etc. Takes off under own power, fast realistic flights. Complete \$2.50. Order direct from this ad. Money order preferred.

Address—SILVER FLASH MODELS
Box 88 PORTLAND, PA.



For the purpose of protecting the model aircraft buying public a number of manufacturers in the miniature aviation field have formed the MODEL AIRCRAFT MFR'S. ASS'N., Inc.

By carefully enforcing upon all members certain rules and agreements for raising the quality and value of their kits and supplies the ASSOCIATION will bring to model airplane enthusiasts assurance against disappointment and uncertainty in their purchases. Look for this "Seal of Approval" when buying model kits and supplies. Among the model firms who will be entitled to use this emblem November 1st are:

Bennett, Broadfield, Comet, Hawk, Ideal, Kilpatrick Co., Lennon, Madison, Mountaineering, National, Red Bird, Rochester, Scientific, Silver Flash, Toledo, Travis, Universal, Wisconsin, Woburn.

MODEL AIRCRAFT MFR'S. ASS'N., Inc.

285 Madison Avenue New York City

WE PAY POSTAGE!

Make up your Christmas order from this list. All materials guaranteed.

18" STRIP Balsa
1/16 sq. — 10 for .05
1/16 sq. x 1/8 — 5 for .05
3/32 sq. — 5 for .05
1/8 sq. — 2 for .03
1/8 sq. — 2 for .06
For 30" lengths double 18" cost.

18" SHEET Balsa
1/32 x 1/8 — 2 for .07
1/16 x 1/8 — 2 for .09
3/32 x 1/8 — 2 for .10
1/8 x 1/8 — 2 for .15
1/8 x 1/8 — 1 for .11

SILK JAP TISSUE
White — per sheet .03
Red — per sheet .05

CLEAR OR COLORED DOPE
All colors
1/2 oz. bottle — .05
5 oz. can — .25

BAMBOO
1/32 x 8" — 3 for .02
1/16 sq. — per dz. .05
1/16 x 1/8 x 15" — .01

COLORLESS CEMENT
1/2 oz. tube — .05
1 oz. tube — .10
3 oz. can — .25

THRUST BEARINGS: small .02, large .03; **BUSHINGS:** small—per doz. .04; large—per doz. .06; **CELULOID WHEELS:** 1/2"—per pair .10, 1"—per pair .12; 1 1/2"—per pair .15, 1 3/4"—per pair .25; **WASHERS:** small—per doz. .08, large—per doz. .05; **RUBBER:** .045, 1/16 sq., 1/8 sq., 1 ft. for 1c; 3/16 sq., 2 ft. 2c; **WIRE:** 2 ft. for 1c.

20" DETAILED PLANS: *Lowing* Boeing P26, Boeing P-12F, Northrop Gamma, Spad, Sparrow Hawk, Curtiss Swift, Vought Corsair — each 10c.

No orders under 35c. Canadian order 35c extra.
DEALERS SEND FOR LARGE DISCOUNTS
MODEL AIRPLANE UTILITY CO.
1140 — 53rd STREET, Dept. C BROOKLYN, N. Y.

Air Ways—Here and There

(Continued from page 45)

Fuselage

1. Vernon Boehle 7:57
2. Russ Hofmeister 5:20
3. William Pascoe 4:19
4. James Neff 2:34
5. Ira J. Hassad 2:25

Experimental

1. John Dawson
2. William Kuntz
3. Vernon Boehle
4. George Mackie
5. William Pascoe

Junior Aviation League—Boston

IN the monthly contest held on September 2nd and conducted and sponsored by the Jordan-Travel Model Aviation League, the world's record for hand-launched, weight duration models was unofficially broken by a member of the above club.

The model, after flying 22.03 entered a cloud, disappearing from sight still a good 2000 feet up. The pusher which made this sensational flight is a test design which members of the J. A. L. are preparing for next year's national contest.

The J.A.L. now holds one indoor record and is reorganizing the entire club in an effort to win the other two indoor records.

Fullerton Aero Club

On Saturday, December 2nd, the Fullerton Aero Club will hold its fifth annual model airplane exhibition. Three large beautiful trophies are to be given as prizes as well as one eight foot wartime propeller, (possibly this is to help push along the activities). Two gold medals and several other prizes are to be awarded.

The planes are to be divided into three classes with one trophy awarded for each class. Write to the Fullerton Aero Club, Fullerton, Pa.

Aero Model Builders Guild Contest

One of the largest scale model contests to be held this year is being sponsored by the Aero Model Builders Guild. The new Douglas Airliner, a story of which appears in this issue, is the model selected for the builder to make. This ship is the latest thing in air transportation. Prizes consist of first prize, a 6000 mile trip over the TWA system in one of the new 200 miles per hour, Douglas Airliner. Second prize, a 3000 mile trip over the TWA system in one of these same ships. Third prize, a Texaco silver trophy presented by the Texas Company. Other prizes include subscriptions to Universal Model Airplane News.

CORRESPONDENTS

THE Model Aero Club of Great Neck, L. I., would like to correspond with a model club in Australia. Here is a chance for some of the Australian boys to help out some of the model builders of this country. Write to N. G. Rietmann, Third Street & Grace Avenue, Great Neck, L. I., N. Y.

W. R. Hunt of 1545 Dunbar Street, Vancouver, B. C., Canada, would like to correspond with some model builders in the States.

W. P. I. Fillingham of 5 Pelham Crescent, The Park, Nottingham, England, would like to correspond with American

and Australian model builders who specialize in commercial flying models.

The Book Plate

(Continued from page 34)

form and actual photographs of the fuselage in finished state and in skeleton form are shown.

Some of the interesting and useful high lights of the book are:

- Aviation dictionary, Model log
- Glossary of model terms, 600 pages
- 77 full page photographs
- Official book of U. M. A. N.
- Flying Army Blimp
- Dealer's list
- Flying autogiros
- 500 illustrations, 85 full page plans
- Charles H. Grant, (Editor)

Aviation Advisory Board

(Continued from page 32)

Answer: No. Silk is the finest covering that can be used, unless it is a flying scale model in which case tissue should be used.

Question: Which are the best dopes for coloring a finished model?

Answer: This depends upon the type of model you are building. If it is a scale model non-flying, we would suggest that you use a lacquer dope not an enamel.

Donald C. Roylance, Hyattsville, Md., has some problems he wishes solved.

Question: I have made four low-wing planes. Each has a tendency to turn over on its back and lie down hard. Why?

Answer: This is a pretty large order to fill with the amount of information which you have given.

Offhand we would say that the center of gravity of your plane was too far back. The only cure for this trouble is to shift the wings back to the center of gravity or point of balance, or, add weight to the nose in order to bring the center of gravity to a point which is approximately one-third of the wing chord back from the leading edge of the wing. Turning the rear edge of the stabilizer downward would absolutely not correct the trouble. This would complicate your problem. The stabilizer on a low-wing usually should be set at an angle which is approximately two degrees less than the main wing.

The World's Greatest Airliner

(Continued from page 43)

and all items forward of the fire wall, including the complete oil system and engine cowling, is quickly detachable and interchangeable right and left. Dual controls are of the individual wheel type with pedal foot controls.

Under T.W.A. specifications, the latest type Western Electric Company two-way radio system has been installed, including direction beacon receiver. All wiring is carried in separate aluminum conduit, one set each for radio low voltage and high voltage leads. Two airway flares are mounted in the rear of the fuselage.

Two landing lights of 35 amp. rating are mounted in the nose of the fuselage, together with a warning light and there are the customary navigation, instrument and cockpit lights.

DOUGLAS "AIRLINER" DATA

Model DC-1

12 Passengers

1. Engines (2)

Wright Cyclone, Model SGR-1820-F-3

Rating

Sea level, 650 HP @ 1900 rpm

8000 ft., 710 HP @ 1950 rpm

Critical (supercharged) altitude, 8000 ft.

Gearing, 11.16.

Compression ratio, 6.4:1

Blower ratio, 8.3:1

Octane rating, 87

2. Performance with 17,500 lb. gross weight, (as obtained during TWA acceptance tests).

Sea level 8000 Ft. 14,000 Ft.

Maximum

speed — 188 mph 210 mph

Cruising,

75% power 184 mph 190 mph 200 mph

Cruising, 65.5%

power 169 mph 177 mph 185 mph

Landing speed 60 mph.

Rate of climb—1050 ft./min. 950 ft./min.

Service ceiling—23,000 ft.

Absolute ceiling—25,000 ft.

Absolute ceiling, one engine 9,000 ft.

Absolute ceiling, one engine, with one-half normal fuel dumped 11,000 ft.

3. Weights

Weight empty, including

radio & all equipment 11,780 lbs.

Useful load — 5,720 lbs.

Gross Weight — 17,500 lbs.

4. Range and Pay load (range for cruising at 62.5% power at 5000 ft.)

Range (mi.) 515 865 1200

Fuel (gal.) 215 (1) 360 500 (3)

Oil (gal.) 24 30 40

Pass. (No.) 12 12 10

Payload

Passengers

@ 170 lbs. 2040 2040 1700

Baggage

@ 30 lbs. 360 360 300

Cargo 1510 595 80

TOTAL 3910 2995 2080

(1) Minimum fuel

(2) Normal fuel

(3) Maximum fuel

5. Dimensions and Data

Span—85 ft.

Length—60 ft.

Height—16 ft.

Wing Area—940 sq. ft.

Wing Loading—18.6 lbs./sq. ft.

Power Loading—12.3 lbs./HP

Length of cabin—23 ft.

Height of cabin—6 ft. 3 in.

Width of cabin—5 ft. 6 in.

Total volume of cabin—780 cu. ft.

Vol. front cargo compartment—108 cu. ft.

Vol. rear cargo compartment—112 cu. ft.

Total volume cargo compartment—220 cu. ft.

Model News From Other Countries

(Continued from page 23)

attain an effective picture, the ships were launched from in back of the trees so that they would stall in flight. Most of the planes were five feet or more in wing-spread. You will note their large size by examining the picture closely.

Picture No. 2 shows Sam Baker holding some of the cups which were given as prizes. Capt. A. W. Robertson is on the right. He takes an extreme interest in the model flying club activities.

Queensland has been quite active with R.O.W. models. Picture No. 3 shows a group of contestants at a recent meet. J. Lowther, won the R.O.W. contest. At the time the wind was blowing a gale. No mention has been made from our correspondent as to which young man in the picture is Lowther, although we are making a guess that it is the one on the extreme right. Our guess is based on careful examination of the models in the picture, as regards their flying qualities.

England

J. FORD of 272 High Street North, Manor Park, E.12, London, England, writes and tells us that the British hand-launched fuselage duration record has been raised to 23 min. 10 sec. This beats the previous empire record held by Australia. Ford would like to correspond with some American builders. He has many English aeronautical journals which he would be glad to swap for American airplane literature.

W. P. I. Fillingham, 5, Pelham Crescent, The Park, Nottingham, England, has sent us picture No. 4, of his 5 foot, 6 inch span model. It weighs nine ounces and is powered with a geared motor.

Greece

Nicholas J. Limber of 190 Odos Pattision, Athens, Greece sends us picture No. 5 of himself and one of his recent models. He says that the inspiration to build his ship came from dreaming about a model of this type in a nightmare he had when he was in New York. Having lived in New York for a good part of my life, I can readily understand what prompted the nightmare. Possibly he was caught in a jam at Times Square at 5:00 the evening previous.

He tells us that he is organizing a club in Greece for air-minded young men and promises to let us hear from him. We will look forward with great interest to news from his part of the world.

Spain

Picture No. 6 shows some young men of Madrid, Spain at a recent model exposition held under the guidance of the Spanish War Ministry. It is evident that many countries are beginning to realize the value of model building and flying as a means of obtaining aeronautical information.

Japan

The importance of model building and flying as a means of education is emphasized by picture No. 7, which shows young model builders who have attended an exhibition of model planes held recently at the Haneda Airport near Tokyo, Japan. The prize-winning plane flew for a distance of about half a mile. More than 400 model planes were entered in the contest.

The Official Book of "Universal Model Airplane News"

COMPLETE MODEL AIRCRAFT MANUAL

By Edwin T. Hamilton

600 pages 66 models
85 plans 77 photographs
120 insignia 500 illustrations
Aviation Dictionary Dealer's List

Closed Cabin Autogiro
Curtiss-Wright Jr.
Waco Taper Wing
Northrop Gamma "Sky Chief"
S. E. 5
Loening Amphibian
Bowlus Sailplane
Curtiss-Wright Sedan
Pittcairn Autogiro PCA-3
Curtiss Shrike YA-8 Attack
Stearman Mailplane
Flying Army Blimp
Sikorsky "American Clipper"
Grant "Minute Man" Tractor
German Fokker D-7
Umbrella-tail Tractor
Lockheed-Vega "Winnie Mae"
Wedell-Williams Special
Mile-a-minute Twin Pusher
Curtiss Helldiver
All-in-one Model
Boeing P-936
Fifteen-minute Championship
Tractor
Laird Super-Solution
Hand-launched Twin Pusher

AND 41 OTHERS

Price \$3.50

HARCOURT, BRACE and COMPANY
383 MADISON AVENUE
NEW YORK, N. Y.

Please send Detailed Circular on Complete Model Aircraft Manual to

CLASSIFIED DIRECTORY

Advertise in this directory for quick results. Rate: 10¢ per word. Cash with order. Minimum space, 10 words. January Advertisements must be in by November 10th.

PROPELLERS, hand carved plus shaft, 5¢ per inch. Michael Cretia, 95-19 42nd Ave., Elmhurst, L. I.

GEN. Balbo's (855X) Savoia-Marchetti, 100% true scale 13 1/2" solid model; only genuine replica in U.S. Complete kit, including generous supply highest quality materials, full size plans, etc. 50¢. Make extra money selling finished models of this famous plane. On demand everywhere! Crescent Model Aircraft, 1307 Benson Ave., Bklyn, N. Y.

MARVELLOUS new engineering system for model aircraft. Makes possible construction from one ounce to five pounds. Vast scope for ingenuity. 10¢ coin pasted on letter brings information. H. Ferguson Model Aircraft Engineer, 2121 Wellington St., Montreal, Canada.

20" TWIN propelled streamlined ice racer \$1.00; with pontoons, \$1.50. W. Griffin, 43 Girarde Ave., Springfield, Mass.

20" NORTHROP Gamma, Akron Fighter and Spad Kits containing printed Balsa parts, shaped propeller, etc. 60¢ each. Catalog Free. Hawthorne Model Aero Co., Hawthorne, N. Y.

"BEAM Scale Kit" 50¢ postpaid, simple design, weighs objects from 1/1000 oz. up; indispensable to scientific builders. Interested in "Indoor Supplies". Send 3¢ for catalog. "Jasco" 328 East 6th St., New York City.

XMAS Specials, Send 3¢ stamp for price list and Special Christmas Bargains. Art Kronfeld's Supply, 215 Mountain Ave., Arlington, Mass.

FREE Price list. Your address on a post card brings it. Model Aero Shop, Huntington, L. I.

SAVE Money! Balsa scrap bundle. All wood usable. Liberal assortment of strips, sheets, blocks, \$2.00 value for 75¢ postpaid. Limited supply. Model Co., 1140 53rd St., Bklyn, N. Y.

ATTRACTIVE 12" Martin Bomber Kit, 50¢. Oriole Model Aircraft Co., 813 W. Barre St., Baltimore, Md.

SPECIAL—Plans that really flies, complete outfit material, prepaid 25¢; Gliders 10¢. Chester Werts, P. O. Box 926, Fresno, Cal.

DEALERS and Clubs—Write for our Price List of Model Airplane Supplies. We guarantee you won't be sorry. Prices lower than ever! Wholesale only. United Model Supply Co., P.O. Box 351, 16 Court St., Bklyn, N. Y.

JAPANESE Model Airplane Tissue, 32 colors, also Wood Veneer. Send for samples. See our ad, this paper with Jap. Girl's Face. Whitfield Paper Works, Importers, 12 Vestry Street, New York City.

AIRPLANES—EQUIPMENT

ARMY Air Corps gives one year free flying course, 250 hours solo flying, salary while learning. Send 20¢ for information booklet telling how to qualify and apply. Used Airplanes \$85 and up. Literature 10¢. Federal Equipment Co., Dept. 10, Deerpark, Ohio.

OLD COINS

SAVE Indian Head Pennies! We pay up to \$20.00 each. Send dime (coin) for list. Ingram, 318 Third, Greensburg, Penna.

ORDER WITH CONFIDENCE
FROM ADVERTISERS IN
THIS MAGAZINE



NEW! Duplex Model Builders Knife

HANDLE AND 2 INTER-
CHANGEABLE KNIVES
COMPLETE

Not to be confused with ordinary razor blade knives. Blades are made of superior carbon steel absolutely unbreakable. A durable life-time tool, especially designed for every branch of model airplane construction. Set includes: (1) Straight blade for cutting sheet and plank balsa. (2) Curved blade for accurately carving propellers, cowlings and other shaped parts. (3) Nickel-plated handle, knurled for steady grip! Just snap with the thumb to interchange blades! No other model building knife on the market to compare with it. Every model builder everywhere needs one of these utility cutting tools. Send for yours today.

25¢

COMPLETE

Plus 5¢ for Packing
and Postage



DEALERS! JOBBERS! Write now for special discounts on this Fast Seller.

BROADWAY AERO CLUB

4996 BROADWAY (near 212th St.) NEW YORK
Pay us a visit. New 8th Ave. Subway to 207th St. Sta. or I.R.T. Subway to 215 St. Sta.

Build a fleet of these 6" SOLID SCALE MODELS



Spad
Gee-Bee
Fokker D-7
Lockheed Sirius
German Albatross
Bellanca Airbus
Ford Trimotor
Curtiss Hawk R-6-E
DEALERS, DEPT. STORES, JOBBERS.—These kits sell profitably at 10¢. Write for prices on our low-priced line of Kits and Supplies.

15¢ Ea.

UNIVERSAL

MODEL AIRPLANES, Inc.
4016 CHURCH AVE., BROOKLYN, N. Y. Dept. X-1

"Shots" From the I.A.A.P.E.

(Continued from page 45)

judge of any type aircraft photo. Of course it is needless to be said but our own Benny Heinowitz, our secretary, didn't get a moment's rest until the contest was over:

From Seattle comes news of the Boeing XF7B-1, a new Navy Plane, but no details are available due to the fact that it is still in its experimental stages. Also, over the city of New York was seen a Mystery ship of all-metal design which may have been the new Northrop XA-13 two-seater fighter for the Services? It looks somewhat similar to Frank Hawk's ship and is rumored to fly at 200 m.p.h., or faster with a full military load of guns, bombs and all. This ship is supposed to carry 7 machine-guns. A veritable flying fortress, we would call it.

We fly off until next month and we hope that you bulb squeezers (photographers to you), will not be afraid to write in, and send news and all to Ye Scribe. "Till next month."

Building the De Havilland Gipsy Moth

(Continued from page 13)

leading and trailing edges and rear spar in plane on the plans. Then glue in all the ribs in their respective places. Make center section the same way. Make wings in four parts.

When the wings and center section are completed, sand the leading and trailing edges to shape. Then sand the entire wing.

Covering

Cover the sides of the fuselage first, then the top and bottom. Cover both tail surfaces and glue in place on fuselage and glue stabilizer strut ("SS") in place. Then cover all the wings on top and bottom. Banana oil gives the best results.

Assembly

THIS should be done with the utmost care as it is essential that the model should be assembled accurately to acquire perfect flying.

Glue the two top wings on the center section so that you may obtain the proper dihedral. When doing this, use very little glue as the wings have to be separated later. Glue the center section struts on the fuselage. Now glue the whole top wing on these struts. Let dry thoroughly. Then glue on bottom wings and struts, being very careful that they line up with the top wings. Do not forget to give the bottom wings 1/8" angle of attack.

Now put on flying wires and thick thread for hinges. The "X" spare are put on to keep the wing from going out of place. You now proceed to separate the wings from the fuselage and center section leaving them hang by the hinges. Now glue on light hooks to the wings and put small rubber bands on the hooks to keep wing closed during flight.

If you want to dress the model, paint all the struts black and the spinner and streamlines red.

If the foregoing instructions are closely followed you will have a perfect flying scale model of the Gipsy Moth and it should show very good performance in flying.

SLASHED!!

The price of our fast flying record breaking "WIZARD" From \$1 to

50¢

Plus 10¢ Postage

This kit contains printed balsa rudder, stabilizer, ribs, wing tips, cylinders and nosepiece, formed wire parts, split bamboo, rubber balsa strips, 2 sheets tissue, prop blank, cement, dope, full size plans and instructions. ORDER YOURS NOW!



"CURTISS ROBIN." A beautiful 12" Flying model kit, contains all parts to complete this flyer.

20¢

Postpaid

3 Kits for 50¢ P.P.

Supplies—Grade A1—No Postage

Send 10¢ for 36" 18" Balsa Strips
1/16x1/32, 10 for .05
1/16x1/16, 10 for .05
1/16x1/8, 10 for .10
1/16x3/16, 10 for .10
3/32x3/32, 10 for .10
3/8x1/8, 2 for .03
1/8x1/4, 2 for .04
1/4x1/4, 2 for .06
1/2x1/2, 1 for .05
18" Balsa Planks
1x1, 1 for .13
1x2, 1 for .23
1x3, 1 for .30
1x6, 1 for .40
2x2, 1 for .28
2x6, 1 for .70
Cauldroid Parts
1/2" dia. pair — .10
1" dia. pair — .12
1 1/2" dia. pair — .15
1 1/2" dia. pair — .25
3" 9 cyl. Motor .45
18" Balsa Sheets
1/32 x 2 — 2 for .07
1/8 x 2 — 2 for .10
1/4 x 2 — 2 for .15
1/2 x 2 — 1 for .11
For 36" lengths double 18" price.
Balsa Prop Blocks
3/8 x 3/8 — 1 for .03
3/8 x 1 — 2 for .07
3/8 x 1 1/2 — 1 for .04
3/8 x 1 1/2 — 1 for .07
3/8 x 1 1/2 — 1 for .08
1x1 1/2 x 1 1/2 — 1 for .14
Reed
1/16 or 1/8 dia., 1 ft. 1¢

ACETONE—DOPE

1 oz. 10¢, 2 oz. 20¢

JAP TISSUE

2 sheets .05

BRUSHES

Each .05

COLOR JAP TISSUE

Red, blue, yellow, orange, brown, green. Each .05

THRUST BEARINGS

Large, each .03

Small, each .02

WASHERS

3/8 or 1/2" — .03 5¢

BALSA WHEELS

1" low, black, green, 1¢

1" silver, 2 oz., 30¢.

NRA MEMBER



2017 W. Madison

BAMBOO

1/16" Sq. Coated. 5¢ doz.

WIRE

All Sizes — 5 ft. 2¢

COLOR DOPE

Red, blue, orange, olive drab, white, yellow, black, green, 1¢

RUBBER THREAD

1/32" sq. — 2 ft. .01

1/16" sq. — 1 ft. .01

1/8" flat — 1 ft. .01

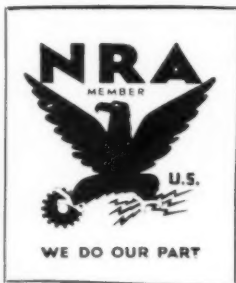
3/16" flat, 1 ft. 1 1/2¢

MERCURY MODEL AIRPLANE CO.

1592 Lincoln Place, Dept. D

Brooklyn, N. Y.

WOBURN where Prompt Service! and High Quality Always Rate FIRST!



And now, (with Christmas almost with us), would be a good time to select Woburn Kits and Supplies for holiday gifts. They're always welcome.

WOBURN SUPPLIES

known by model builders everywhere for their uniform high quality, accuracy and **MONEY BACK GUARANTEE**



15 inch HELL DIVER
Complete 44c P. P.

**WOBURN'S FAMOUS
15" FLYING MODEL KITS**
Your choice of 14 good scale models.
Each kit contains a liberal supply of
everything to build perfect planes.

44

**EACH
Post
Paid**

Lockheed Orion
Lockheed Vega
Bellanca
Laird Super
Solution
Boeing P 12 B
D. H. Tiger Moth
Gloster Seaplane

Supermarine S6B
Bernardi Pursuit
Pfalz
Fokker D 8
Amphibian
Polish P.Z.L.
Ansaldo Pursuit



15" FOKKER D-8
Complete Kit 44c P. P.

**20" Models—a delight to build
a thrill to fly**

1.25

**EACH
Post Paid**

Spad Pursuit
Curtis Swift
L. W. Pursuit
Sparrow Hawk
Vought Corsair
Texaco Sky Chief
Monocoupe
Boeing 247

Transport
Boeing P 26,
Low Wing
Boeing P 12F
Pursuit
Gee Bee (23")
Super Sportster

(Plans Alone 10c ea.)



BOEING 247 TRANSPORT
Complete \$1.25 P. P.

BALSA WOOD

24 inch lengths

| | |
|-------------|-----------|
| 1/32 x 1/16 | 3 for 2c |
| 1/16 x 1/16 | 3 for 2c |
| 1/16 x 3/32 | 3 for 2c |
| 1/16 x 1/8 | 3 for 4c |
| 1/16 x 3/16 | 3 for 4c |
| 1/16 x 1/4 | 3 for 8c |
| 1/16 x 1/2 | 3 for 8c |
| 3/32 x 3/32 | 3 for 4c |
| 1/8 x 1/8 | 3 for 6c |
| 1/8 x 3/16 | 3 for 6c |
| 1/8 x 1/4 | 3 for 8c |
| 1/8 x 1/2 | 3 for 10c |
| 3/16 x 3/16 | 3 for 10c |
| 3/16 x 5/16 | 3 for 12c |
| 1/4 x 1/4 | 3 for 12c |
| 1/4 x 1/2 | 3 for 16c |
| 5/16 x 5/16 | 3 for 14c |
| 1/2 x 1/2 | 3 for 20c |
| 1 x 1 | 1 for 16c |

SHEETS

24 inch lengths

| | |
|-----------|-----------|
| 1/100 x 2 | 7c each |
| 1/64 x 2 | 6c each |
| 1/32 x 2 | 3 for 14c |
| 1/16 x 2 | 3 for 18c |
| 1/8 x 2 | 3 for 18c |
| 3/16 x 2 | 3 for 20c |
| 1/4 x 2 | 3 for 24c |
| 1/2 x 2 | 3 for 30c |

PARA RUBBER

| | | |
|-----------|----------|--------|
| 1/32 sq. | 1 ft. 1c | 50 ft. |
| 3/64 flat | 1 ft. 1c | 25c |
| 1/16 flat | 2 ft. 3c | 45c |
| 1/8 flat | 2 ft. 3c | 50c |
| 3/16 flat | 2 ft. 4c | 55c |

DRAG RINGS

| | |
|--------------|-----|
| 1 1/2" diam. | 20c |
| 1 3/4" diam. | 23c |
| 2" diam. | 25c |
| 2 1/4" diam. | 25c |
| 2 1/2" diam. | 30c |

COWLINGS

Open Face and Closed Type

| | |
|--------------|-----|
| 1 1/2" diam. | 20c |
| 1 3/4" diam. | 23c |
| 2" diam. | 25c |
| 2 1/4" diam. | 30c |
| 2 1/2" diam. | 35c |

SHEET CELLULOID

2" x 6" 1 for 4c

2 ft. Stinson Detroiter 1.00

This model is a winner for endurance and stability. Plans for 2-ft. Stinson Detroiter, 10c each.



Send 3c stamp for price list.

No orders under 25c accepted. Canadian orders same as U. S. Dealers and Clubs write for discounts.

CEMENT

| | |
|---------------|-----|
| Small Bottle | 5c |
| Large 6" tube | 16c |
| 4 oz. bottle | 35c |

DOPE and ACETONE

Colored and Plain

| | |
|----------------------|---------|
| Small Bottle | 5c |
| 1 oz. Bottle | 10c |
| 4 oz. Bottle | 35c |
| Brushes | 5c each |
| 1/16 O.D. Brass rod | 6c ft. |
| 1/16 I.D. Brass tube | 15c ft. |

THRUST BEARINGS

| | |
|-------|---------|
| Large | 3c each |
| Small | 2c each |

BALSA WOOD BALLOON TYPE WHEELS

| | |
|--------------|----------|
| 1 1/2" diam. | 6c Pair |
| 1 3/4" diam. | 8c Pair |
| 2" diam. | 10c Pair |
| 2 1/4" diam. | 12c Pair |
| 2 1/2" diam. | 24c Pair |

WASHERS

| | |
|------------|---------|
| small 3/32 | 3c doz. |
| Large | 5c doz. |
| Medium | 3c doz. |

CELLULOID WHEELS

| | |
|--------------|----------|
| 1 1/2" diam. | 10c pair |
| 1 3/4" diam. | 12c pair |
| 2" diam. | 15c pair |
| 2 1/4" diam. | 25c pair |

DOUBLE GEARED WINDERS

Smooth running 25c each

DUMMY MOTORS

| | |
|--------------|-----|
| 1 1/2" diam. | 25c |
| 2" diam. | 35c |
| 3" diam. | 45c |

CELLULOID PANTS

| | |
|-------|----------|
| Small | 30c pair |
| Large | 45c pair |

POLISHED DURALUMIN MOTOR PLATES

| | |
|------------------|-----|
| for 1 1/2" motor | 8c |
| for 2" motor | 10c |
| for 3" motor | 12c |

JAP SILK TISSUE

| | |
|---|----------|
| White | 3c sheet |
| Colored | 5c sheet |
| Colors: Red, Blue, Yellow, Green, Brown, Black, Orange. | |

STRAIGHT (PIANO) MUSIC STEEL SPRING WIRE

| | |
|---------------------------------|---------|
| No. 5, 6, 8, 10, 12, 14, 16, 18 | |
| 2 ft. lengths | 1c each |

FLAT BAMBOO

| | |
|------------------|----------|
| 1/16 x 1/4 x 11" | 6 for 5c |
| 1/16 x 1/4 x 15" | 6 for 7c |

REED

| | |
|------------|----------|
| 1/32 diam. | 5 ft. 5c |
| 1/16 diam. | 5 ft. 5c |
| 1/8 diam. | 4 ft. 6c |

ALUMINUM TUBING

| | |
|-----------|--------------|
| 1/16 O.D. | 1 1/2 ft. 8c |
| 3/32 O.D. | 1 1/2 ft. 8c |
| 1/8 O.D. | 1 1/2 ft. 8c |
| 3/16 O.D. | 1 1/2 ft. 9c |

SANDPAPER

Special for Polishing Balsa

Per Sheet 4c

PRIME MOVERS

For 2 elastics 40c each
For 3 elastics 75c each
Insignia Sheet 10c each
24 Insignias and Rudder strips

HEATH BABY BULLET

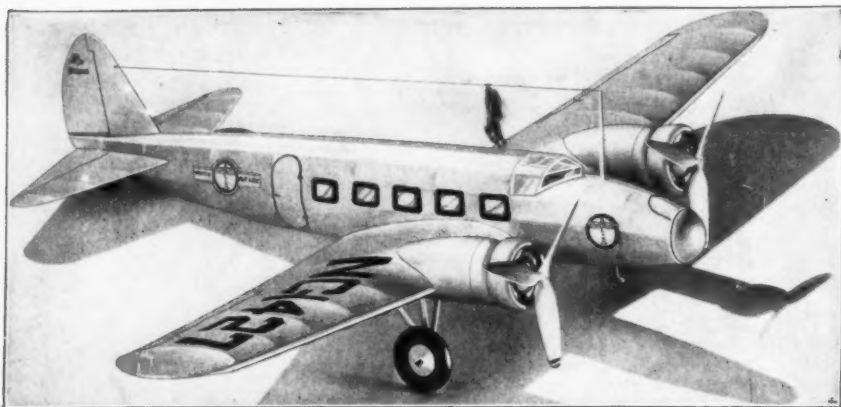
Complete kit with plans for 7 1/2" flying model.

15c
Post Paid

WOBURN

MODEL AIRPLANE SHOP
19 Belmont St., Woburn, Mass. Dept. M-12

The MODEL EVERYBODY RAVES ABOUT!



The New BOEING TRANSPORT 247



Flying Scale Model



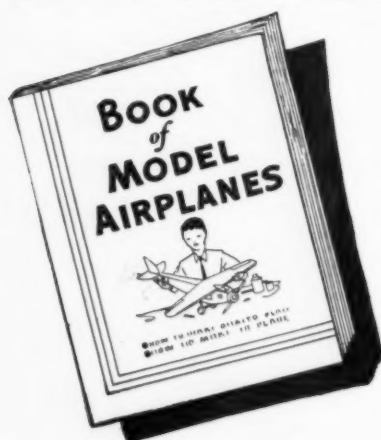
What a Ship— What a Model!

This flying scale represents the big 25' wingspan BOEING TRANSPORT 247 Plane which is called "The Flying City!" Such features as heat and light plants, a telephone system and other features make the Boeing Transport Wa-p-powered plane of United Air Lines the latest thing in design and construction. Imagine it streaking through the skies at 3 miles per minute carrying its passengers, stewards, Pilot, Mate and mail and baggage and express! Build the NEW Comet model of this Boeing—NOW!

A COMPLETE KIT!

Printed balsa rib, bulkhead sheets—longeron strips—sandpaper—rubber motor—balsa leading, trailing edges 1 1/2" dia. wheels—printed prop blade outline—silver dope—shred bamboo—noseblock—cement—banana oil—window cellophane—Boeing insignia, numerals—balsa cylindrical nacelles, engine cowings—package with washers, prop shafts, rear hook, bushing, fitting. **FULL size plan, instructions, Jap tissue, waxed tissue.** What a BARGAIN is this twin-motored Boeing Kit at only \$1.50 prepaid or at Dealers. Order before prices go up! Today!

\$1.50



The Book You've Been Waiting For!

Tells the story of the airplane in easily understood language! Teaches you, step by step, how to build beautiful models that really fly! Over 100 pages packed full of fascinating reading and scores of illustrations—plus actual plans of several popular model airplanes. Gives you a flying start in model building! Send for your copy of the "BOOK OF MODEL AIRPLANES" now—use the order-blank below—**50c**

Partial list of contents: Why an Airplane Flies, The Story of Balsa, Handy Model Kinks, Useful Aids to Model Builders—and **FOUR FULL-SIZED PLANS!**

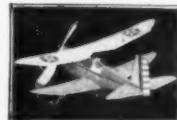
The New Flying Scale FOKKER D7



75c

SQUADRON No. 1— Save \$1

In Squadron No. 1 you get the four planes, below in one box, a \$3.25 value, for only \$2.25. You save \$1.00! Just write "Squadron No. 1" on order coupon below.



**C-1
Pursuit**

75c

**Curtiss
Robin**

\$1



**The
Dipper**

50c

**Red
Racer**

\$1



Here's a Honey! The NEW AERONCA!

A peach of a flier—and so easy to build! This is the plane which holds the altitude record for light planes—and it's the favorite sport model of the world's greatest flyers. Another scoop by Comet—complete kit—**75c**
16" wing span



NEWS FLASH!

A breath-taking, life-like model of the planes in which the Italian flyers flew from Rome to Chicago!

Complete kit **75c**

**Big Solid
Reproduction
BALBO
PLANE**

COMET MODEL AIRPLANE & SUPPLY COMPANY
3114 Harrison, Dept. M-125, Chicago, U.S.A.

() Send articles listed. I'll pay postman for articles, C.O.D. fee, postage, on delivery.

() I enclose \$_____ for articles listed. Comet pays postage.

NAME _____

STREET _____

CITY _____

STATE _____

SEND NO MONEY — JUST SEND COUPON

Dealers!
SALES GUARANTEED on Comet's great Dealer Plan, backed by National Advertising! Fine profits made! WRITE!

100% Satisfaction Guaranteed!
Order the convenient C.O.D. way: mark, mail coupon—pay for planes, C.O.D. fee, postage on delivery! We pay postage on cash orders. Remit cash by Money Order—if check, add 15c extra. CANADIANS: No C.O.D. stamps, nor coin. Internationals! Money Order only, plus 20% extra. **HURRY! ORDER NOW—FAMOUS COMET SERVICE WILL AMAZE YOU!**

**Colored
Catalog!**

Only 5c

Finest catalog out! Send for yours—**HURRY!**

Buy from Comet Dealers—or Send Direct

!

200
Plane
Sun
tele
the
of
design
rough
g to
mail
NEW

geron
lead-
inted
ham
inflow
balsa
ckage
bush-
tions.
BAR-
it at
r be

le

planes
only
quad-

t



r



PON

d
g!
ic
atalog
for
RY!